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A New Power of Propulsion.

A Boston correspondent sends us an extract cut from a paper of that city, but republished from an English journal, and asks an opinion respecting the wonderful invention which it describes. The substance of the extract is as follows:—

"It is now found that the immense amount of resistance encountered at the heads of ships and steamers, which increases at a ratio approaching to the square of the velocity, can be converted into useful power, instead of being, as at present, all sustained as dead loss. A method for achieving this has been patented by Robert Griffiths, engineer, London, inventor of the screw propeller which bears his name, and consists in forming the lower part of the head of the vessel with a revolving cone, around which are wound spiral flanges. By this arrangement, the resisting water, instead of falling upon the ordinary bows, impinges, when the ship is in motion, upon the screw flange, and this causes the cone forcibly to revolve. The power thus obtained from the cone is transmitted by shafting and multiplying gear to work a screw at the stern, if a sailing vessel, or to go in aid of the engine, if a steamer. Confidence is entertained that not only will the speed of steamers be greatly increased by this mode of dealing with resistance, but that the invention must lead to the creation of a class of profitable self-acting screw clippers, whose speed will far exceed the best modern-built ships."

We consider the invention of Mr. Griffiths as worse than useless. This is not the first time that similar devices have been proposed for employing the resistance of the water through which a vessel is driven, to propel it, and upon the same fallacious principle as that of Mr. Griffiths. All the power which he proposes to obtain from the resisting action of the water is by presenting an extra amount of resisting surface to it, by his spiral flanges. By such devices the loss must be equal to the gain; this appears to be a self-evident fact in mechanics. Instead of such a self-acting screw increasing the speed of vessels, as has been stated, it would diminish their speed; and we must say it is falsely called "self-acting." If it were a self-acting power it could propel a vessel without sails or steam, but this it cannot do.

"THE new steamer *Voyageur de la Mer*, built for the Pasha of Egypt, remains at East Boston, and since her trial trip, her sails have been unbent, the yards sent down, and she will not leave for her destination at present. A failure."

[The above paragraph, from an exchange, is mysterious, and needs some explanation. What are the reasons for this failure?—EDS.

TURNER'S COMBINED SMUTTER AND GRAIN SEPARATOR.

Fig. 1

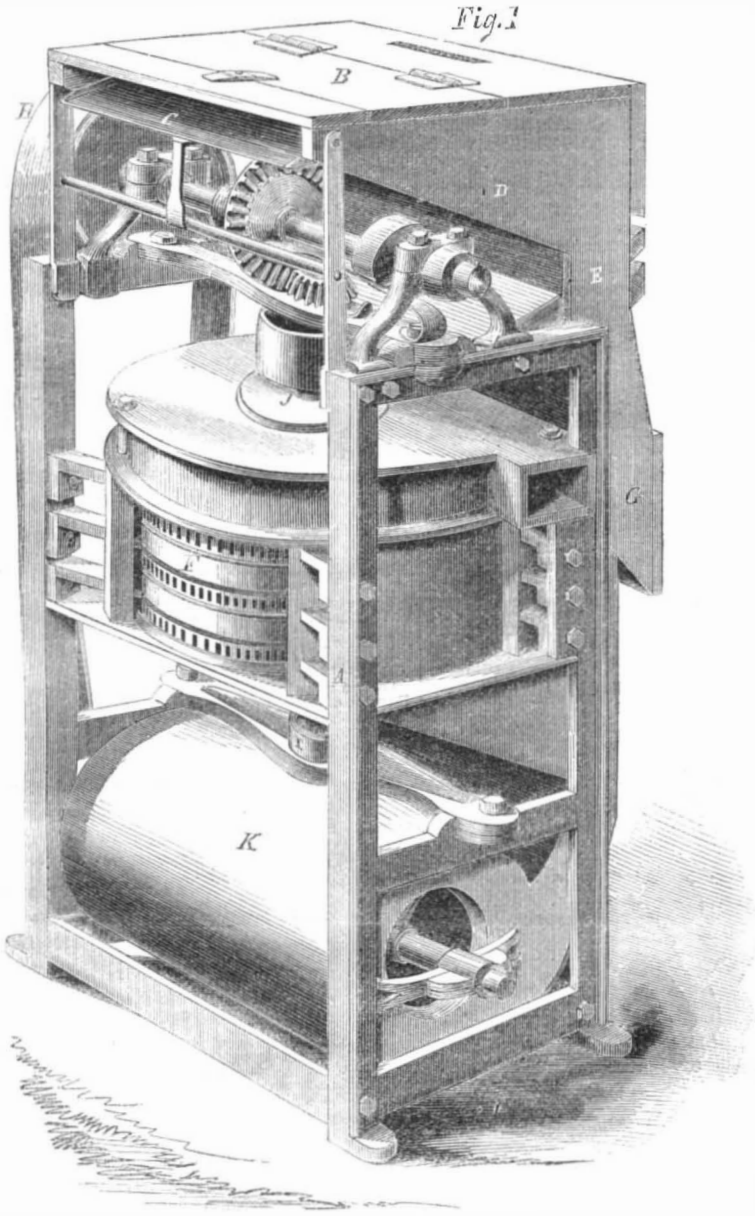
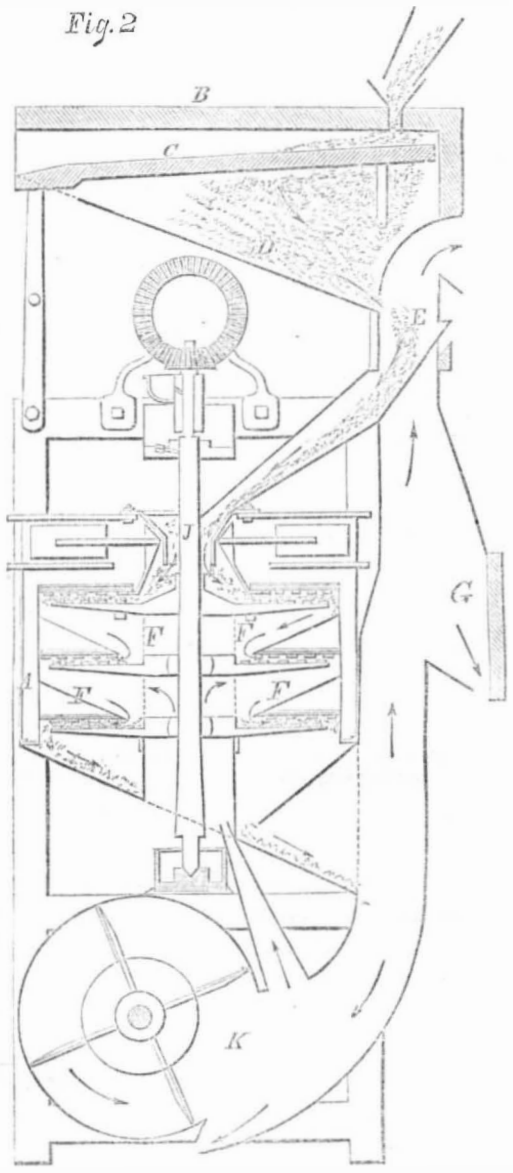


Fig. 2



Wheat always contains, when brought to market, more or less smut, dust, chess, and other foul stuff; and in passing it through a smut mill, if the grain be the least damp, the smut dust, &c., is liable to adhere. It is absolutely necessary that the dust should pass out of the machine as soon as scoured from the berry, that the grain may not wallow in it.

In the machine shown in the engraving, the smutter is composed of from three to five sets of horizontal scouring plates, between which the grain passes. The lower plate or runner of each set is provided with beaters, which throw the grain against the upper plate, which is stationary, and also provided with beaters, thereby causing the grain to act against both plates with equal certainty and uniformity. A rough or sharp surface is not depended on for scouring; but it is claimed that what the machine will do the first month it will continue to do for years in the same manner.

Fig. 1 is a perspective view of the whole machine, and Fig. 2 a section through its working parts. Similar letters of reference indicate corresponding parts in both figures. A is the frame in which the machine is mounted. The grain enters at the top, B, where it first falls upon a zinc or sheet iron riddle, C, through which the grain passes, taking off sticks, stones, &c., over it. The grain then falls upon the first inclined plane, D, then into the first blast, E, from the fan at the bottom of the machine, which takes out most or all of the smut balls, oats, chess, and other light impurities, before the grain enters the smutter, F. This all millers know to be of the greatest importance, particularly if the grain be damp. The grain then passes out of the blast of the separator into the smutter, F, and passes through the machine as indicated by the arrows in Fig. 2, discharging the screenings at the angle in the enlarged spout, G. This machine makes five distinct separations:—First, The hoads, sticks, &c., over the riddle. Second, Screenings from the first blast, which are the lightest, and before the grain passes to the smutter. Third, The dust. Fourth, Screenings from the second blast of the separator, after the smutter. These last screenings are free from dust, and in a good condition to grind for feed or otherwise. Fifth, The clean grain.

Only one driving belt, H, is required, and but two in all, and can be as easily attached as any upright smutter. Rolling screens may be dispensed with, except for cockle. The inventor states that it takes less power to drive it than is required to drive most of the common smut mills.

The step, I, of the smutter shaft, J, is the only place from whence arises any danger from fire by the friction of smut mills; hence the absolute necessity of having the step always in sight, and convenient to be oiled, with no liability to run dry, from its situation being unapproachable without taking the machine to pieces.

It is the invention of G. B. Turner, and was patented May 8, 1855. Further information may be had from the manufacturers, Turner, Parks & Co., Cuyahoga Falls, Ohio.

New Process of Amalgamation.

The ordinary gold quartz rock of Virginia seldom yields more than $3 per tun, while the assayers and chemists who assay and analyse it say that it ought to produce from $50 to $60 per tun. The reason why it cannot be extracted is, that the gold is in a state of such fine division that without the quartz is ground as fine as flour the quicksilver cannot act on it and amalgamate with the gold. Mr. John M. Wyckoff, of the Melville Mining Co., Spotsylvania Co., Va., has discovered a method of extracting from $20 to $30 per tun from this rock by the simple process of boiling the broken rock in water with half its weight of quicksilver, when the quicksilver seems under the influence of heat to acquire some new attractive power for gold and to enter the pores of the rock and liquefy it out. The sand or rock is first concentrated by a mechanical arrangement to about one-fifth its bulk, and the cost of the process is is not more than $5 per tun, at the above mines where it is in operation.

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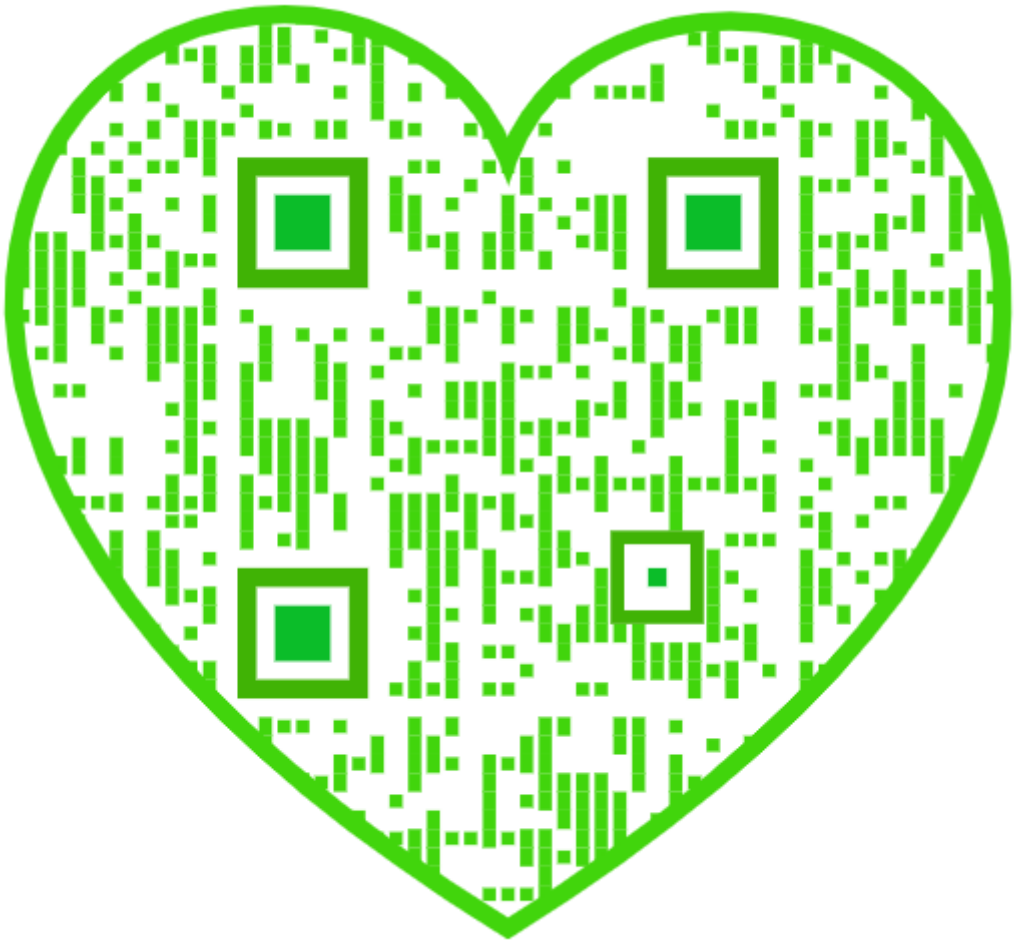

Issued from the United States Patent Office

FOR THE WEEK ENDING JANUARY 5, 1858.

[*Reported officially for the Scientific American.*]

SEED PLANTERS—H. F. Baker, of Centerville, Ind. : I do not claim, broadly, the use of clearers, in combination with seed drill teeth, as this is common.

But I claim the arrangement of hook-pointed edged blades, or other suitable clearers, in such relation to the points of the drill teeth to one another on the shaft, that in the revolution of the shaft they alternately come on opposite sides of the teeth, and pass down slightly below the points of the same, substantially as and for the purposes set forth.

[For a further description of this, see another column.]

SPINNING OAKUM—Smith Baldwin, of St. Louis, Mo. : I claim, first, The employment of two series of revolving, straight or knife-edged combs, J, J, arranged and operating as described, for the purpose of taking the web of carded oakum in an unbroken sheet from the doffer.

Second, The employment, in combination with the said endless moving apron, O, and the stationary apron, e, belonging to the first conductors, P P, of the roller, S, operating as and for the purpose specified.

[A notice of this will be found on another page.]

RAILROAD CAR BRAKES—J. L. Branch, I. Branch and D. W. Branch, of Charleston, S. C. : We do not claim, in general terms, the idea of drawing the upper end of the brake levers, x x, &c., towards the center of the car (thus clamping the wheels with the brake blocks) by a winding up of the chains at the end of rods, m m, for this has been done already by means of a rod passing up into a car with a wheel fixed at its upper end, and worked by a man usually called a brakeman.

But we claim the drum arranged and worked as set forth.

We claim to operate the brake blocks of a continuous train of cars, by means of a steam cylinder or hand power, in combination with the drums, levers, and chains, substantially as set forth.

We also claim the drum, E, and surplus chain, E′, the object and use of which is substantially set forth in the specifications, as are also our other claims.

SUPPLY-COCKS—Wm. S. Carr, of New York City: I do not claim the use and secondary supply of water, neither do I claim any peculiar arrangement of pipes, in connection with such two supplies and a hot water boiler, nor do I limit myself to the manner of arranging the water-pipes shown in Fig. 2, as the same forms no part of my invention.

But I claim a weighted diaphragm, x, or its equivalent, and seat, l, between the secondary supply and the hot water boiler, in combination with the valve, k, or equivalent, between the primary supply and the hot water boiler, substantially as and for the purposes specified.

PAINT VEHICLES—A. C. Church, of Union City, Mich.: I claim the compound for mixing paints, composed of the within specified materials, combined in the manner substantially as and in about the proportions set forth.

[This is described on another page.]

SEWING MACHINES—D. W. Clark, of Bridgeport, Conn. : I claim, first, Feeding the cloth in sewing machines, by means of a rocker, J, arranged and operating substantially as described.

Second, The employment of a hinged slide, Q′, to flatten and hold the loop, substantially as and for the purposes set forth.

FLOURING MILLS—Edwin Clark, of Lancaster, Pa. : I claim, in combination with the bolt, I, and hopper formed by the sides, L M, the separate conveyors, Q W, and the slides, b d, connected together, and operating in the manner set forth, for the purpose of making such a separation of the ground material as will obviate the necessity of requiring the bolt to carry the material any farther than is actually necessary to bolt it—to avoid all danger of clogging, whilst conveying the separate qualities to their exit or elevators, and prevent any possibility, by the perfect separation, of returning that which is too light to be re-ground, to the stones, as explained.

BOLSTER FOR PLATED TABLE KNIVES—Orestes Cleveland, of New York City : I claim a table knife made substantially as described.

[The object of this invention is to supply a bolster to plated knives, so that when the plating wears off the bolster, it being made of a white metal, if the blade is coated with silver, or a yellow, if gold is the plating employed, the bolster will still appear in some harmony with the blade, and the wear will not be soon discovered.]

HUSKING AND SHELLING GLOVE—Emil Cohen, of Washington, D. C. : I claim the husking and shelling glove, as described, as a new article of manufacture, when constructed and operated substantially in the manner and for the purposes set forth.

RAKES FOR HARVESTERS—Samuel Comfort, Jr., of Morrisville, Pa. : I claim, first, Imparting to the rake the required movement along the platform and parallel or thereabouts with the same, by means of the sliding frame, E, and slotted bracket, i, in combination with the lever, K, arm, M, and segments, m and n, when arranged in relation to each other as shown, and for the purpose specified.

Second, Producing the lateral reciprocating, combined with the lifting, movement of the rake and its appendages, by means of the connected radial arms, G and G′, as actuated by the crank, D, and rod, F.

SEEDING MACHINES—I. H. Conklin, of Rockford, Ill. : I claim, first, The hoppers, j, and the hopper, F, when arranged with the bar, B, as shown, and used in connection with the bar, E, provided with shares as described, so that the seed may, by the same mechanism, be distbibuted from either hopper, and sown either in drills or check rows as may be desired.

Second, I claim the disk, c′, attached to the wheel, A, and provided with teeth, d′, arranged in connection with the disk. b′, for the purpose of operating intermittently the bar, B, for the purpose specified.

[This invention consists in the peculiar construction of the machine, whereby it may sow either in hills, drills or broadcast, and give a greater or less quantity of seed in a given area.]

RAILROAD CAR COUPLING—J. M. Connel, of Newark, Ohio: I do not claim embracing a tongue by plates, when said tongue has a longitudinal movement between the plates, as shown in the expired patent of Hunt & Brown.

But I claim the plates, a a, tongue, L, link, b, and chains, h h, in combination with each other and the vulcanized india-rubber casing embracing the plates, when the connection between plates and tongue is such as to prevent their moving longitudinally upon each other, as set forth.

HYDRANT—Richard De Charms, of Philadelphia, Pa. : I do not claim to have invented a plug aud hydrant operating on the principle of wasting water by a three-way-cock, but I merely claim to have improved them (as they have been from time immemorial constructed on that principle) by a very peculiar simplification of their operation. For in respect to so much of my present improvement as pertains to the voiding of the waste water, that which I do claim is—

The making the solid rod of the three-way cock, by which it is operated, a tube bent at the top so as to let on, stop off, and waste the water, by the simple turning of that tube as the top of a faucet. This combining of the first two with the last of these three functions in the vertical motion of a single member of the three-way-cock is what I claim as the gist of my improvement of that hydraulic machine, and this feature of my claim, together with the provision of the two air-tight chambers, and the shaft for deriving the waste water as well from the outside as from the inside of the plug or hydrant, substantially as set forth.

LIME KILNS—H. R. Fell, of Texas, Md. : I claim the peculiarly constructed air chambers, D D′, intermediate between the inner and outer surfaces of the wall of the kiln and arranged as described, for the purposes set forth.

[A full description of this appears on page 147.]

FLOUR BOLTING—David Geib, of Mifflintown, Pa. : I claim the bolts, C D, two or more, provided with conveyors, spouts, and elevators, combined and arranged with each other relatively as shown, or in an equivalent way to effect the purpose set forth.

[The object of this invention is to avoid the necessity of re-bolting all the meal, good and inferior, in one and the same bolt, and thereby keeping the superior portion free from those substances which darken it or render it speckled.]

ATTACHMENT OF ADJUSTABLE FOOT BOARDS TO SPLINTS—John Gruol, of New York City: I am aware that in the patent of Geo. Jarvis, 1843, a rack and pinion are used for the purpose of giving the necessary extension of the side frame, therefore I disclaim such use of racks and pinions.

I claim the combination of an adjustable foot-piece D, with the board, A, substantially as set forth.

[This is a very good splint to hold fractured limbs in a proper position while healing.]

SEED PLANTERS—Marshall Hunt and J. H. Haines, of Rising Sun, Md. : We claim a vibrating slide formed with an offset, d, substantially in the manner and for the purpose described.

Second, Giving to said slide a vibrating motion by means of cross-heads, G, having a third arm, H, extending from it, substantially in the manner and for the purpose set forth.

OPERATING TELEGRAM KEYS—John J. Hayden, of Rising Suu, Ind. : I claim the particular formation of the levers into dots, lines, and spaces of any desired length, thereby securing perfect mathematical accuracy in the formation of the ciphers which compose the "Morse Telegraph Alphabet."

BIT HOLDER—B. B. Hill and S. W. Adams, of Chicopee, Mass. : We claim the combination of the two boxes or bearings, placed at any required angle with each other, with the intervening globular connection which forms a casing for the beveled gear.

HYDRANT—John Hyde, of New York City: I claim the application and use of a siphon to hydrants, for the purposes specified, constructed and arranged substantially as set described.

CONDUITS—James Ingram, of New York City : I claim the fingers, d, or their equivalents, set and moving on the pipe or slide, a, and actuated by the rod, b, substantially as and for the purposes specified, and in combination with said fingers, a, so set and actuating, I claim the clamp plate, e, on the rod, c, for the purposes specified.

MEASURING THE SUPERFICIES OF BOARDS—S. C. Kennerd, of South Newmarket, N. H. ; I claim the combination of the stationary ledge, B, or its equivalent, the arm or lever, C, the mechanism carried by such lever and the indicator apparatus, the whole being constructed and made to operate substantially in the manner and for the purpose set forth.

SHINGLE MACHINE—Robert Law, of Portage City, Wis. : I claim, first, The combination of the pendulous frame, B, which receives the bolt, I′, and the saw, D, arranged substantially as and for the purpose set forth.

Second, The peculiar means employed for securing and adjusting the bolt, I, in the pendulous frame, E, viz., the adjustable plate, I, loaded cord, K, connected with spring, L, the corrugated bottom plate, F, and lever G, with bar, b′, arranged substantially as shown and described.

[A description of this invention will be found on another page.]

CHURN—S. F. Lefler, of Racine, Wis. : I claim a churn constructed in two compartments, A and B, the one open and other closed, when provided with gate ways, x and y, and gate, G, or their equivalents, the whole being arranged in the manner substantially as set forth, whereby the cream during the operation of churning is passed in a continuous current through them, and the butter gathered together for the purposes described.

DOVETAILING ROTARY CUTTERS IN THEIR HEADS—G. H. Mallary, of New York City : I do not claim a spiral cutter or a cutter made straight on the outer surface of the arm.

But I claim the mode described of attaching spiral cutters to the curve segmental surface of the arms by tongues and grooves for the determination of their proper position, and for forming recesses for the heads of the bolts by which they are affixed all as fully set forth.

PROCESS FOR DYEING SILK—Nicholas Mary Aine, of Philadelphia, Pa. : I claim submitting the fabric to the combined action of steaming, and to that of friction rollers, during or after the dyeing process, as described.

WASHING MACHINE—Samuel P. Mecay, of Killbourne, Ohio : I am aware that reciprocating wash-boards have been proviously used and arranged in a great variety of ways, and I therefore do not claim separately, either of the parts shown.

I claim the arrangement and combination as shown of a lever, D, washboard, B, arm, F, and dash-board, G, so that by the movement of lever, D, the boards, B G, will simultaneously approach each other, and act upon the clothes, each board doing its share of the work, and by a reverse movement of lever, D, the boards, B G, will simultaneously separate, and leave an open space for the admission or removal of the clothes.

[This invention consists in the employment of an adjustable wash-board and a reciprocating dash-board placed within a suitable box, whereby a very efficient machine is obtained, and one that may be made to operate equally well for light or heavy articles, fine or coarse fabrics.]

BENDING TIN—George W. Merk, of Leavenworth, K. T. : I claim the two clamping bars, F and G, arranged at an angle to each other, with each leg of the angle hinged to the bed, so that the apex of the angle can be raised from the bed to insert the sheets of metal, and closed down upon them to bend them, and raised again to remove the bent sheets, as described.

And in combination with the described clamping bars, F and G, I claim the folding or bending bars, H and M, for bending the edges of the sheets of metal, as described.

I claim the spring gage, R, so arranged that it may be raised to gage the sheets, and spring down, so that it may be removed.

CONSTRUCTION OF BROOMS—Abner Mitchell, of Eaton, Pa. : I claim the metal socket, A, with shank, a, and cross bars, B C, attached, the cross bars having rods or bars, b b′ f f′, attached or connected at one end by joints, so that the whisks of broom corn may be secured or clamped between them, for the purpose set forth.

[This invention consists in having a metal socket attached to two clamps, whereby the whisks of corn are firmly secured together, and also the socket which receives the handle is firmly secured to the whisks of corn, so that a durable, cheap and efficient broom is obtained.]

METAL TIPS FOR TOES OF BOOTS AND SHOES—George A. Mitchell, of Turner, Maine : I am aware that in George S. McWalters' rejected application for a patent (1847) it was proposed to cover the ends of shoe lasts with metallic tips, and therefore I disclaim the application of such tips to lasts.

I claim a boot or shoe the toe part of which is provided with a metallic tip, A, as described.

COTTON GINS—James F. Orr, of Orrville, Ala. : I claim making in the ribs or grates of cotton gins, either jointed or rigid, one or more openings for the passage of seed and dirt, as set forth.

ELECTRO-MAGNETIC SPEED GOVERNOR—George M. Phelps, of Troy, N. Y. : I claim causing a centrifugal or other suitable speed governor to regulate the motion of the machine or instrument with, or by which such governor is driven, by making the governor close and break a current of electricity, which operates an electro-magnetic contrivance, arranged to work whatever device or mechanism is employed, to change the speed of the machine or instrument, as described.

CONSTRUCTION OF SHIPS—John Reeves, of Brooklyn, N. Y. : I claim tying the bilge timbers or planks of a ships' hull together, and also preventing vibrations of the sides of the hull, by means of strong knees, which conform to the curve of the bilge and diagonal braces, which attach to said knees, and bear in opposite directions through said knees against the bilge and top sides of the hull, substantially as and for the purposes set forth.

[For description of this invention, refer to another page.]

ATTACHMENT FOR LIGHTING LANTERNS—Albert C. Richard, of Newtown, Conn. : I claim the spring, E, provided with the sockets, c, and the rod, F, provided with the catch, g, in combination with the rod, i, and corrugated plate, j, the whole arranged and operated in the manner and for the purpose set forth.

[This is described on another page.]

MANUFACTURING PAPER—Stephen Rossman, of Stuyvesant, N. Y. : I am aware that the use of guide rollers in various relations to the main cylinders is common in paper machinery; examples are seen in the patents of G. W. Turner, January 27, 1852, and D. G. Jones, December 11, 1855. I make no claim to anything contained in those devices. But to the best of my knowledge and belief it is new, in the manufacture of paper, to lift the web from the press roll, as I have described.

I claim lifting the web of paper from the upper press roll, c, by means of a lifting roll, F, arranged and operating as set forth.

[We have noticed this invention in another portion of this journal.]

SHEARS FOR CUTTING BANK NOTES, &c.—Stephen P. Ruggles, of Boston, Mass. : I claim the keeping of the moving blade in close and equal contact with the stationary one throughout their entire length, and the allowing of the blades to separate at the heel when in the act of cutting, as described and represented.

LIGHTENING SEA-GOING STEAM VESSELS—John C. F. Salomon and George W. Morris, of Baltimore, Md.: We claim so attaching the engine and support of the boiler to movable or detachable bottoms and sides of the vessel, that they may be dropped out, and thus relieve the vessel of its weight, in the manner set forth.

HARNESS SADDLES—Henry Sanders, of Utica, N. Y.: I claim the flanged plates, A and B, when constructed and arranged in relation to each other, in the manner as and for the purposes set forth.

RAILROAD CAR COUPLING—John Schneider, of Chicago, Ill. : I claim the circular rotating hook bolt, in combination with tumbler and trigger, when so constructed and arranged as to operate substantially in the manner set forth, that is to say, when both the coupling and uncoupling is effected automatically, by lifting the bolt for the passage of the link, either by the direct action of the link against the tumbler, or by the downward pressure upon the trigger, in, and by the act of one of the cars running off the track, respectively, for the purpose specified.

OYSTER OPENERS—John Seipel and William Rupp, of Washington, D. C.: We claim the hollow shaft, in combination with the double levers, for operating the adjustable knife, and these with the movable bed plate or rest, the whole being relatively arranged, and constructed as set forth.

TURNING LATHES—William D. Sloan, of New York City : I claim the combination of the series of radially sliding rests, as described, in combination with the series of shifting mandrels, as and for the purpose specified.

DENTISTS' OPERATING CHAIR—George W. Tripp, of Auburn, N. Y. : I claim first, The arrangement of the holding and releasing catches, and of the adjusting mechanism, as described, so that all the adjustments can be made from the rear of the chair without stooping.

Second, The combination of supporting rods, l, with the inclining link, r, arranged as described, for the purpose set forth.

RAILS FOR RAILROADS—Levi B. Tyng, of Jersey City, N. J. : I claim a solid enlargement of the ends of railroad rails, in order that they may rest more firm on their foundation, and for increasing their strength and solidity, thereby rendering them less liable either to fractures, wear, unevenness or destruction at their ends or joints, essentially in the manner described and set forth.

POTATO PLANTERS—H. Wainwright and S. T. Williams, of Farmingdale, N. J. : We do not claim the employment of a fork for drawing potatoes from a hopper in planting, being aware that such has been before used.

But we claim the combination of a tripping fork, H, with a reciprocating trough, I, so that the fork will, by a uniform movement, alternately take a potato from the trough and deposit it in the drill tube, as specified.

We also claim the arrangement of the inclined reciprocating troughs, I I, with revolved winged rollers, i i, operating as described, in combination with the hopper, L, provided with removable bottoms, m m, whereby the potatoes are supplied as fast as required to the the troughs, as described.

We also claim the wedge-like projections h h, in combination with the reciprocating trough, in the manner and for the purpose set forth.

HARVESTERS—Jesse Whitehead, of Manchester, Va. : I am aware that concave wheels have been used heretofore on harvesters, therefore I make no claim to a concave wheel as such.

But I claim the concave supporting wheel, D, constructed and located as shown and described, in combination with the recess in the shoe, for receiving the rim of said supporting wheel, the whole being constructed in the manner and for the purposes set forth.

MATHEMATICAL DIVIDERS—John E. Earle, of Leicester, Mass., (assignor to himself and Samuel Shepherd, of Nashua, N. H.) : I claim operating compasses, dividers or callipers, by means of a circular revolving cam, as described.

LATHE FOR TURNING WOOD—Amander N. Wilcox, of Watervliet, N. Y. : I do not claim the employment or use of slides carrying cutters, and operated by patterns or guides acting in combination with springs.

But I claim the use of cutter slides, M and N, moving vertically, and acting by their own weight, in combination with the levers, a b, rods, d e, and pattern guides, L, constructed and arranged to operate the cutters, E and G, as described.

I further claim the combination of the cutter slides and cutters, arranged and operated as described, with the slides, H and J, and their operating mechanism, so as to support the article being turned close to the cutters, excepting when the square parts of the article need passage through the said slides, substantially as described.

OSCILLATING STEAM ENGINES—Adam Wood, of Pittsburgh, Pa. : I do not claim the exhaustion of the steam through the valve.

Nor do I claim, broadly, the attachment of the steam chest to the cylinder to oscillate therewith, and operate in combination with a stationary valve.

I claim the employment of a treble-armed centrally balanced valve, D, as described.

[This invention relates to the arrangement of the steam-chest, the valve, and the passages for the induction and eduction of the steam to and from the cylinder.]

SEWING MACHINES—George Fetter, (assignor to himself and Edward Jones,) of Philadelphia, Pa. : I claim first. The combination of the looper R, with the spindle N, when the former is rendered adjustable to the latter, in the manner described, and when the spindle is allowed to turn so as to accommodate itself to the lateral movement of the looper.

Second, The combination of the finger, p, with the looper, R, in the manner and for the purpose specified.

HOMINY MILLS—Ezra Fahrney, of Deep River, Iowa, (assignor to John Donaldson, of Mount Morris, Ill.) : I wish it to be distinctly understood that I make no claim in this application to an intermittent feeding and discharging device for hominy machines, having two slides, one arranged at top, and the other at bottom of the cylinder, said slides being operated alternately by a cam wheel, driven by a worm wheel and screw shaft, as such an arrangement was patented by me in 1855.

But I claim as an improvement on the mill patented to me on the 15th of May, 1855, the employment of two self-closing hinged flap valves, i m, at the top and the other at the bottom of the cylinder, A, in combination with a ratchet, C, arranged loosely on the hub of the cylinder, and having two pins, g h, on its face, and being actuated slowly by a pawl, f, which is connected with a crank shaft, E, by means of a vertical rod, G, and jointed elbow lever, d e, as and for the purposes set forth.

[This hominy mill has an intermittent feeding and discharging device, so that only a certain quantity of corn is admitted into the mill at once, and when that is thoroughly broken it is discharged, and a fresh quantity admitted.]

PLATFORM SCALES—James Kelly, (assignor to himself and John Sherry,) of Sag Harbor, N. Y. : I claim the combination of the bars, B, by linking together the extremities of the arms, c, when the said bars and arms are arranged in respect to each other, as set forth.

[Full particulars of this invention will be found in another column.]

DETERMINING THE ARTIFICIAL HORIZON FOR QUADRANTS, &c.—James C. Lane, of Brooklyn, N. Y., (assignor to himself and T. H. Barnes, of New York City): I claim the combination of the eye-piece, hair line and vertical mirror, when attached to, and used in connection with, a sextant, quadrant, or similar instrument, in the manner and for the purpose set forth.

INSTRUMENT FOR OPENING CANS—Ezra J. Warner, (assignor to himself, William H. Warner and Rufus E. Hitchcock,) of Waterbury, Conn. : I claim the combination of the curved cutter, a, with the looped bar, c, when constructed and made to operate, substantially as described.

DESIGNS.

STOVES—N. S. Vedder, of Troy, N. Y., (assignor to W. Eddy, of Waterford, N. Y.)

COOKS' STOVES—Garrettson Smith, Henry Brown and Samuel H. Sailor, of Philadelphia, Pa., (assignors to Alexander Small and E. G. Smyser, of York, Pa.

STOVES—Charles J. Shephard, of Brooklyn, N. Y.

ADDITIONAL IMPROVEMENT.

PLOWS—Beniah C. Hoyt, of Port Washington, Wis. Patent dated September 6, 1856 : I claim the adjustable axle, H, with angular journals, C H′, and adjusting arms, I I′, in combination with the stirrup or standard, D, rotary mold-board, or mold-boards, G, and ground propelling or driving wheel, N, as and for the purposes set forth.

Our Patent Business.

During the last three weeks, *sixty-five* patents have been issued to applicants whose papers were prepared at the Scientific American Patent Agency. This is unprecedented in the history of inventive progress, and cannot fail to attract the attention of all who have patent business to transact. We pay special attention not only to the preparation of applications, but also to rejected cases. We invite all who have such cases to correspond with us. Our force is equal to any amount of business of this character that may come into our hands.

Circulars of information sent free.

Philadelphia Statistics.

The *Pennsylvania Inquirer* publishes certain statistical information of the above city, from which we extract the following. In 1857, the mean temperature for the whole year was 51° 01′; 1856 being but 51° 20′, the average of the whole year differed but a part of a degree from the preceeding. In 1856 there fell 43·92 inches of rain, while in 1857, 42·20 inches fell—a decrease of over one inch. The quantity of gas made in the three works belonging to the city was 470,000,000 cubic feet.

A MAGNIFICENT electrical machine has been constructed in Boston for the University of Mississippi.

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[For the Scientific American.]

The Malt House Ruins.

On the 2d of December last, a new malt house in Bethune street, in this city, fell, and was the cause of two men, who were working in it, losing their lives. As this accident necessarily led to an investigation as to the cause of the catastrophe, various opinions were expressed by the witnesses examined, and some of them contradicted one another. As it involves important questions in architectural engineering, the following article on the subject, will be found deeply interesting, not only to merely scientific, but to all practical men:—EDS.

What was the cause of the "accident"? Were the floor beams or the posts at fault? Upon this point the builders who testified before the Coroner did not agree. An investigation into the strength and strain may decide the question.

First, of the floor beams. Experiments made to test the strength of hemlock when exposed to a cross strain, (as is the case with a floor beam,) show that 363 pounds is the weight that will break a piece one inch square and one foot long—the weight being at the middle. This is the average of seven experiments. From this unit of strength the resistance of beams of any size may be computed, by the well-known laws of pressure. The floor beams in question were 4×12 inches, and about 18 feet long; they were placed 18 inches apart from centers. To break one of these beams it would require, upon the above data, 11,616 lbs. at the middle, or twice this amount if equally distributed over its length, which is equal to 860 lbs. upon every superficial foot of the flooring on the beams. This is the breaking weight. What was the load? Barley weighs about 35 lbs. per cubic foot. The barley on the floor appears to have been from four to five feet deep. The weight, therefore, per foot superficial, could not have been more than about 175 lbs.—equal to about one-fifth of the weight required to break the beams. The barley might have been raised to the hight of 24 feet upon the floor before the beams would have broken. Hence it is clear that the barley, being only five feet deep, could not have broken the beams. Yet one of the builders testified "that the size and quality of the beams used in that building were positively insufficient."

In regard to the comparative value of pine and hemlock, experiments show that pine will bear only seven or eight per cent more than hemlock; yet one of the witnesses testified that it would bear 150 (!) per cent more, and another witness subscribed to this, and these witnesses were both practical builders. The unit of strength derived from several experiments on the three kinds of wood, spruce, hemlock and pine, are respectively 345, 363 and 390 lbs. Yet one witness said: "I consider spruce as strong as pine, but hemlock I look upon as insufficient." This witness was correct, however, as regards the elasticity of pine, for experiment shows that pine will suffer a greater deflection without injury than either spruce or hemlock, and it requires a greater load to deflect it through an equal space.

Now the posts. These were of red cedar, and of various sizes, those in the second and third stories being from five to eight inches diameter at the smallest end. They were in their natural shape, and some of them so crooked that the largest perfect straight post that could have been sawed from them would have been about 9×5 inches, or, at the most, $3\frac{1}{2}\times5\frac{1}{2}$ inches. This is the effective size, the length nine feet. Now what weight is required to break such a post? Experiments have been made to test the strength of oak, chestnut and locust posts, but not of red cedar. The latter is, probably, stronger than either oak or chestnut, but not locust, although it may be nearly as strong as the latter wood. It requires to bend white oak 6,950 lbs., chestnut, 7,720 pounds, and locust, 10,920 lbs. In each case, this unit of strength is the average of several experiments, and is the weight required to bend a post one inch square and one foot long. There is reason to presume that the strength for red cedar is below 10,000, but let it be assumed at this. Upon this data, a post of red cedar, $3\frac{1}{2}\times5\frac{1}{2}$ inches, and 9 feet long, will require 29,113 lbs. to bend it from a straight line, and something more to complete the fracture. Each post in the building supported about 200 feet superficial of the floor; therefore the 29,113 lbs. is equal to about 140 lbs. upon every foot of the floor.

It has been shown above that if the barley was 5 feet deep, there was a weight of 175 lbs. upon each foot of the floor. This, together with some 25 lbs. for weight of floor timbers, &c., was quite sufficient to break a post of the size stated. From this computation, and the fact that a broken post was found in the ruins, we may safely conclude that the want of size in the posts was the cause of the failure. The posts should have been at least six inches diameter, and perfectly straight at that.

R. G. HATFIELD, Architect.

New York, December, 1857.

Patent Jobs—Commencement of Lobby Operations.

We see that the Chaffee patent is again before Congress, on a petition presented by Mr. Pugh, of Ohio, for its further extension. This may be regarded as the inauguratory operation of the lobby for the session, and the precursor of a host of other jobs of a more or less profitable kind. The presentation of the Chaffee petition is a proof that the Congressional engineers are already at work, and they count upon making a brilliant and profitable campaign of it.

The amount of corruption that will be brought to bear on Congress during the present session will, we believe, be greater than has ever before been known. The results of the Matteson and Gilbert investigation, instead of checking the evil, have given it a greater impulse and extension. The readmission to the floor of the House of the parties expelled for participation in that disgraceful affair has satisfied the lobby men that they have nothing to apprehend from the tone and temper of the present Congress. The profligate bargain by which the spoils connected with the public printing have been portioned out amongst some half dozen political partisans, with the concurrence and assistance of members, is pretty conclusive evidence of the way in which the public interests will be sacrificed. Never before was the lobby so strong, and never were its opportunities for plunder so numerous.

These patent extensions are in themselves an inexhaustible mine of wealth to the lobby speculators, Besides the Chaffee interest, there are some three or four others, such as the McCormick reaper, the Colt's pistol and Hayward india rubber extensions, which are sufficient to make the fortunes of all concerned in them. In addition to these, there are land jobs and other fat pickings, from which trading politicians, starving journalists and idle lawyers can all glean something. Uncle Sam's estate may be compared to an Irish patrimony—it is entailed for the benefit of the hungry and needy.

Under such circumstances, it is of course useless to remonstrate against the injustice of patent monopolies and the perpetuation of the numerous other jobs that are certain to be carried through this session. Corruption is in the ascendant, and the lobby all-powerful. When the country is tired of seeing its most precious interests bartered away by an organized band of blood-suckers who are fattening upon its entrails, it may perhaps think of applying a remedy. In the meanwhile we must be resigned to play the part of Cassandra to an unwilling auditory, and to groan over abuses that we cannot prevent.

[We copy the above from the *New York Herald*, and we rejoice that this independent journal has opened its batteries in good season and with vigor against the system of lobbying at Washington, which has become a disgrace to our country. The patent extension cases are very important, not only to the parties interested, but to the whole country, and we have been surprised to notice the stupid apathy of the leading journals upon this subject. The *Herald* is the only daily journal in New York (we had almost said in the United States) that has fully appreciated these cases, and it has dealt them a powerful blow in times past. We hope it will keep on until not one of these schemes shall stand unexposed to public view.

The Persian Wheel.

This is a contrivance for raising water to some hight above the level of a stream. In the rim of a wheel turned by the stream a number of strong pins are fixed, to which buckets are suspended. As the wheel turns, the buckets on one side go down into the stream, where they are filled, and return full up the other until they reach the top. Here an obstacle is placed in such a position that it overturns the bucket, and the water is poured into a spout or convenient receptacle. It is evident that with this form of wheel the water can only be raised to the hight of the diameter of the wheel, and there is no doubt that it is a very rude contrivance. It is much used in Persia for the irrigation of the land, and very many of them may be seen on the banks of the river Nile.

Polarity.

This is a property possessed by some bodies, which will, when allowed to move freely, arrange themselves in certain determinate directions, or point, as it were, to given poles. Thus, an iron bar acquires polarity by magnetism, and, when suspended from a single point, arranges itself in the direction of the magnetic meridian of the earth. When light is supposed to consist of material particles emitted from the sun, it is necessary to explain certain optical phenomena to assume that the particles are endowed with polarity, which merely signifies that the opposite sides of a particle have different physical properties.

Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims on another page:—

SPINNING OAKUM.—A machine for this purpose has been invented by Smith Baldwin, of St. Louis, Mo., which combines the processes of carding and spinning; and the picked oakum, when supplied to it, is converted into a merchantable state, for the use of caulkers, &c., at one continuous operation.

PLATFORM SCALES.—This invention consists in the peculiar manner of connecting the scale beam with the platform, whereby but little motion is allowed the platform; and the weight upon the platform is made to bear equally upon the lever that supports it; it being immaterial on what part of the platform the weight is placed. It is the invention of James Kelly, of Sag Harbor, N. Y., who has assigned it to John Sherry, of the same place.

BUILDING SHIPS.—This improvement consists in preventing the vibrations of the sides of the ship, and the consequent leakage at the keel, by arranging diagonally two rods and braces in opposite directions from the keel to the top side of the ship; said braces and rods bearing against strong knees or shoes, which securely tie the timbers of the keel together. We regard this as a good arrangement, which ought to be adopted in every large steamer. It is the invention of John Reeves, of Brooklyn, N. Y.

LIGHTING LANTERNS.—This invention consists in having a match socket attached to a spring, which is secured to the inner side of the door, and held back to the side of the door by a catch. A corrugated plate is attached to the inner side of the lantern, and the parts are so arranged that the match which is fitted in the socket will, when the socket is liberated from the catch, have its ignitible end forced over the corrugated plate, and the match being then in a line with the wick, lights the lamp. It is the invention of A. C. Richard, of Newtown, Conn.

PERPETUAL LIME KILN.—This invention provides a perpetual kiln, wherein lime and coal, or fuel, may be mixed or burned together perfectly, in the same kiln, without the necessity of using side furnaces or grates; and the lime, when burned and discharged, is purer, and freer from carbon, ashes, or other impurities which usually escape from the coal or fuel, by reason of imperfect combustion during the process of burning in perpetual kilns of ordinary construction. It is the invention of H. R. Fell, of Texas, Md.

IMPROVED SHINGLE MACHINE.—This invention relates to an improvement in that class of shingle machines in which a circular saw is employed for cutting the shingle from the bolts. The improvement consists in the employment of a pendulous frame provided with a proper clamp to hold the bolt, and arranged relatively with a circular saw, and setting device for adjusting the bolt within the frame; the whole being so arranged that the shingles are cut from the bolt with great facility, and adjusted so as to be cut in proper taper form. It is the invention of Robert Law, of Portage City, Wis.

CLEARING SEED PLANTER TUBES.—This invention consists in arranging a shaft set with edged blades behind the cultivator tubes—said blades revolving with the shaft, and in their revolution passing up alongside of the tubes, and carrying with them such grass, weeds, or obstructions as prevent a perfect entrance of the seed into the soil. This is a device much needed by farmers, judging from the fact that considerable inventive ingenuity has been exercised by previous inventors in constructing a device for accomplishing the clearing of cultivator teeth. It is the invention of H. F. Baker, of Centerville, Ind.

PAPER-MAKING MACHINERY.—The object of this improvement is to prevent the breaking or tearing of the paper, as it passes from the upper one of the second press rolls to the dryer. This is attained by the use of a small roll arranged parallel with the press rolls, between the highest part of the upper press roll and doctor, about opposite the line where the paper should leave the upper press roll, on its way to the dryer, so that the web of paper will pass between it and the upper press roll. The slight cohesion of the web to this small roll eases it off the upper press roll and prevents it breaking; and if a slight break should occur in the web, it prevents the edge of the break being carried under the doctor, and thereby increased. This improvement, though simple in its character, is highly important in its results, and is found, by practice, to effect a great increase in the quantity of paper produced in a given time, by saving nearly all the time that is expended when breakages of the web occur. It is the invention of Stephen Rossman, of Stuyvesant, N. Y.

PAINT VEHICLE.—This is a new compound for mixing paints, and consists of four fluid ounces of oil of turpentine, put into a bottle with one-quarter of an ounce of gum mastic, and one-eighth of an ounce of caoutchouc. These are well shaken three or four times a day for three or four days, and then allowed to rest for a short time. One gallon of soft soap, which should be one year old, and of good quality, is next dissolved over a fire in one gallon of distilled rain water. One gallon of linseed oil is boiled and poured into the soft soap and water with frequent stirring, while both are at about blood heat. The gum mastic and caoutchouc solution is then poured from its dregs and added, and after the whole has been well stirred, it is placed over a gentle fire and heated, the heat being increased for about half an hour until it almost reaches the boiling point, but it must not be allowed to boil. The composition is then strained through a coarse cloth, and when cold is ready for use. It makes a paint that is cheaper than common oil paint, and is more durable, owing to the alkali and gums preventing the oil leaving the paint, and being absorbed by the wood. It is also susceptible of a high polish when well dried, and takes varnish well. A. C. Church, of Union City, Mich., is the inventor.

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New Inventions.

Preventing Incrustation in Boilers.

R. McCafferty, of Lancaster, Pa., patented a new process for this purpose on the 14th of April, 1857. It consists in putting half a pound of black gum catechu in a boiler of 100-horse power, until the water becomes the color of pale brandy, and during the week the water is kept as nearly that color as possible, by adding small pieces of catechu from time to time. So long as this color is kept up, no incrustation forms; and in boilers where there is already an incrustation, its application gradually decomposes the lime, and it falls down, and is deposited in a kind of slush at the bottom, which may easily be washed away through the blow-off cock.

Astronomical Discoveries.

Mr. Alvin Clark, of Cambridgeport, Mass., who was a portrait painter, has now turned his attention to the manufacture of telescopes, and with one of his own instruments he has discovered many double stars not hitherto known, and his observations have been communicated to the Royal Astronomical Society of London, who have confirmed some of his observations. It is to be hoped that an opportunity will be afforded him to construct a large telescope, his largest now being only $7\frac{3}{4}$ inches in diameter. One which he made for the use of the Coast Survey, at a cost of $2400, is said to have been so good that a pole three inches in diameter could be seen at a distance of fifty miles when the atmosphere was clear, but we think that this distance is almost *too* far to be true.

New Method of Filling Front Teeth.

A very ingenious method of filling decayed front teeth, (first suggested, we believe, by Dr. Maynard, of Washington, D. C., inventor of the primer for fire-arms,) has recently been successfully carried into practice by A. J. Volck, M. D. It consists in setting a piece of enamel in the cavity of a decayed tooth much exposed, such as in an upper front one. The enamel for the cavity is of the same material as artificial teeth, and is formed to correspond with the cavity. It is fitted to the tooth loosely, then firmly walled or set in with a ring of gold foil. This is a much handsomer method of filling holes in exposed teeth than by the use of gold foil entirely, as the cavity thus closed only shows a surrounding hair line of gold; all the rest of it resembles the natural tooth.

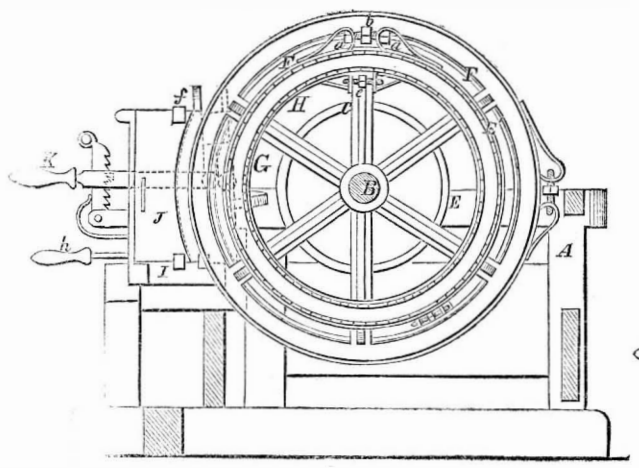
Improved Machine for Sawing Fellies.

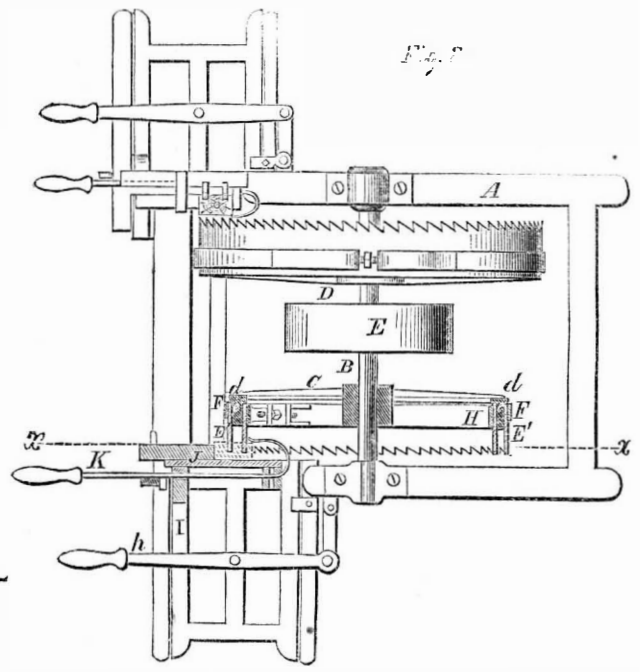
All parts of wheels are now made by the aid of mechanism. The hub or nave is turned in a lathe by steam, the spokes are cut by rotatory knives operated by power, and the fellies are cut by machinery. The above engravings illustrate one of the most recent improvements in machines for sawing fellies, and its construction and operation will be fully understood by the following description, reference being made to the diagrams, of which Fig. 1 represents a vertical section of the machine, being taken through the line, *x x*, in Fig. 2, which is a plan or top view. Similar letters indicate the same parts in each. The invention consists in having two band saws attached, one to the outer and the other to the inner periphery of a wheel, by bands or straps, the outer saw being expanded or contracted by interposing bands between the saw and the periphery of the wheel.

A represents a frame to support the working parts; B is a shaft which is placed on the upper part of the frame, and carries two wheels, C and D, with a driving pulley, E, between. The wheel, C, is considerably smaller than D. E′ is a band saw made of a strip of steel plate with teeth cut on one edge. This saw is secured around the outer rim of C, by means of a metallic band, F, the ends of which are looped and connected by a right and left screw, *b*, and nuts, *a*. By turning the screw, *b*, in the proper direction, the band, F, may be made to clasp the saw tighter, and by turning it in the reverse way the band and saw will be slackened. The diameter of the saw, E′, may be increased or diminished by interposing bands, *c*, between the rim of the wheel and the saw. The saw, E′, and the bands, *c*, (their back edges) rest against the shoulder, *d*, on the outer surface of the rim of the wheel. The cutting edge of the saw projects some distance beyond the rim. G is a saw precisely similar to E′, and it is secured to the wheel, C, by the band, H, (exactly as E′ is attached to C,) which can be expanded or contracted by the screw and nuts, *e*. The two saws, E′ and G, project an equal distance from one side of the wheel, C. On the frame, A, and at one side of the wheel, C, a sliding carriage, I, with a vertical bed, J, is secured. The bed, J, has movable dogs, *f*, applied to it at its upper end, stationary dogs being at the lower end of the bed. The movable dogs, *f*, may be connected with a lever, K, so that they can be raised or lowered. The staff or bolt from which the fellies are cut is secured against the bed, J, by means of the dogs, *f*; and when motion is given to the wheel, C, the bolt is

VAUGHAN'S MACHINE FOR SAWING FELLIES.

Fig. 1



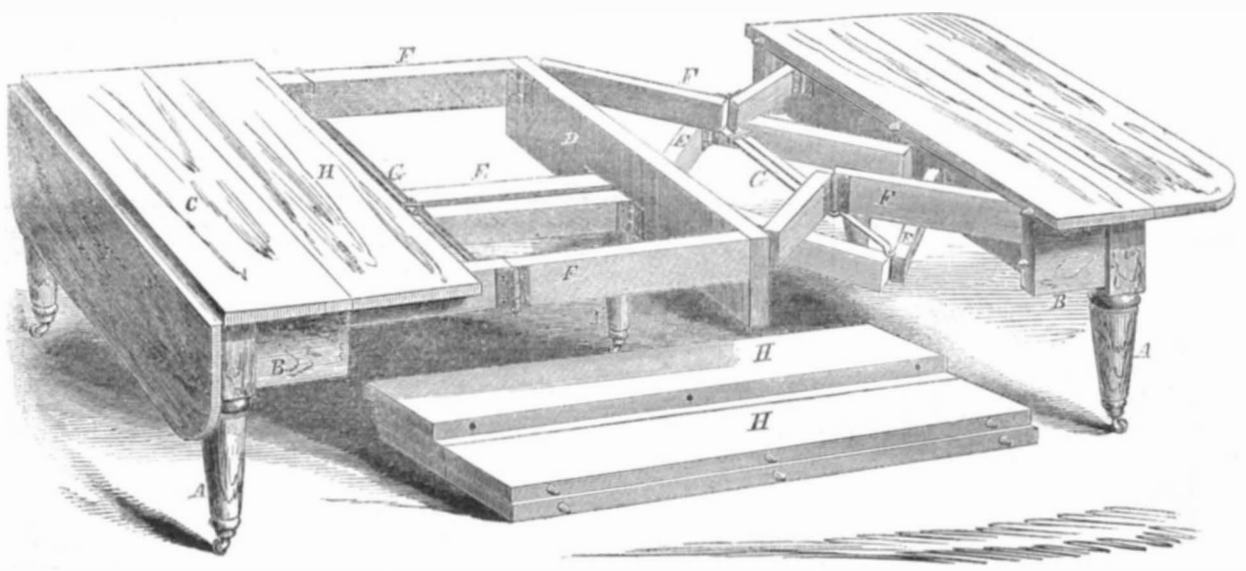


ed against the two band saws by moving the carriage, I, towards the saws by means of the lever, *h*. The two saws cut the fellies from the bolt exactly the shape they are required to be, and the thickness of the felly must depend on the number of rims between the saw, E′, and the wheel, C, and fellies for wheels of different diameters may be cut by having a series of wheels, C, of various diameters. In Fig. 2, D is a wheel precisely similar to C, only of a larger diameter.

This method of securing band saws to the periphery of wheels prevents the passing of bolts and screws *through* the saws at intervals, and the perforation of the saw blades to receive them is unneccessary, so that all the original strength of the saw blade is maintained, and it facilitates their removal for sharpening or other purposes. The saws run clear and cool and cut very rapidly, leaving the felly smooth.

It was patented Nov. 17, 1857, by the inventor, Jacob Vaughan, of Exchangeville, Pa., who will furnish any further particulars. We noticed this invention on page 91 of the present volume of the Scientific American, when the patent was granted.

GROSS'S PATENT EXTENSION TABLE.



The common and laudable desire of all to have a house nicely and conveniently furnished, according to the taste of the individual, has given rise to the exercise of much ingenuity and artistic conception. In all houses there is a necessity for such articles as will be compact and neat, and occupy but little space when not in use, also that will, when required, spread out to accommodate the wants of a larger number than usual. This demand has called forth a supply in the shape of folding chairs, sofa bedsteads, extension tables, and many other articles of a similar nature.

The extension table we are about to describe, and which is represented in our engraving, is capable of being extended to four times its length, thus one made upon this plan would form a convenient side-board in a recess of two feet wide, and could also be made available as a dining-table of eight feet long. The table proper is supported on four legs, A, supporting the ends and folding leaves, together with the sides, B, and permanent top, C. There is another leg, A′, supporting a cross-piece, D, to which are attached by hinges on each side the jointed stretchers, F and E. The base of the hinge-pin of each side of the central hinge in F is attached to a rod, G, whose opposite extremity is connected with the central hinge-pin of E, thus connecting the two systems of stretchers; and the two rigid bars, G, are connected together by a small loose link passing around them. In any position, the table will be fully braced and supported. When the table is wide open, the stretchers assume the strong position seen in the left hand half of D, in the engraving, and when semi-open, they are in the position indicated by the right hand half of the same. The auxiliary leaves, H, fit into one another by pegs and suitable holes and when not in use they can be packed away in any convenient receptacle.

It was patented Nov. 17, 1857, by the inventor, Henry Gross, of Tiffin, Ohio, who will be happy to furnish any further information.

German Newspapers.

It is stated that there are ten times as many newspapers printed in the German language in the United States as there are in Germany. This is certainly creditable to the German population of our country, and they are usually a thrifty, peaceful class of citizens, especially outside of our large cities.

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Scientific American.

NEW YORK, JANUARY 16, 1858.

The Homogeneous Metal.

The article which recently appeared in our columns (page 117) on the above subject has arrested the attention of Joseph Dixon, of Jersey City, N. J., who has sent us a few lines on the subject, in which he states it as his belief that the metal in question is the very same as that which he manufactured in 1847–8, and which was held to be pure iron. We were well aware of Mr. Dixon's experiments, and had seen a plate of his metal; but we cautiously stated in the article referred to that we had not received satisfactory information in relation to the exact nature and composition of *the* metal; but "if it possessed the advantages claimed for it by its inventor, it was one of the most important inventions of the age." We shall yet be able, we think, to elicit the whole truth in relation to it.

Mr. Dixon's pure iron was homogeneous, very strong, quite free from the mechanical imperfections of bar iron; was easily converted into good steel, and rendered suitable for tools, engraver's plates, and other purposes. If the homogeneous metal of Mr. Howell is the same as that of Mr. Dixon, the latter deserves the credit of the invention, as he was the first person, we believe, who effected the melting of a mass of malleable iron, and the purification of it while liquid. Previous to this a few grains of the malleable iron had been fused in the laboratory, but it was considered impossible to render it available for practical purposes. Why is it that no more of Dixon's homogeneous metal has been manufactured than the few specimens under his own special superintendence?

The British government has ordered several tuns of Howell's metal for the boilers of naval steamers; and the manufacture of it is said to be established and increasing in Liverpool. Have our people proved so insensible to the advantages of this metal as to allow Uncle John to "take the wind out of their sails"? Specimens of this metal were exhibited at the Fair of the American Institute, and were tested in various ways. A plate of it was found to be double the strength of boiler iron; and yet the invention has been allowed to slumber for the past ten years without good reasons. This is inexcusable.

We have stated that pure iron is more easily oxydized than iron containing silicon and carbon, owing to the great affinity which iron has for oxygen, especially when exposed to moisture. Mr. Dixon informs us that this is true, chemically, but owing to the homogeneous structure of metal made by his process, it is not so subject to destructive corrosion as common wrought iron, because the fibrous construction of the latter, mechanically, presents more favorable points for the action of the oxygen. This is a very good reason indeed, as it is well known, that a piece of bar iron, exposed to the action of salt water, which is very corroding, soon becomes honeycombed. The moisture seems to permeate through the *lamina* of wrought iron and thereby finds a more extensive surface for oxydizing action, than if it were homogeneous.

There are some materials which occupy a far more distinguished position than others, as aids to man. The chief among these are fuel in a compact form (such as coal or wood) and iron. Without the former, man might cook his food with dry herbage, like the squalid barbarians on the bleak plains of Asia and South America, but he never could rise to the condition of practising the useful arts. Without iron, man could, indeed, rise to that state in the arts of the ancient Phœnicians and Egyptians, in their favorable climates, for they were unacquainted with this metal but without it, practical mechanics and the manufacturing arts never could have arisen to their present high position, which as far transcends that of those ancient nations as the light of the sun exceeds that of the moon. Without iron, steamships, locomotives, printing presses, power looms, and the hundreds of machines which are the assistants and aids of man in his present civilized state, would be unknown. Unlike fuel, such as coal and wood, however, it is a manufacture itself, and is produced by expensive processes. It is evident, therefore, that any improvement in its manufacture must be of great and general consequence. It is for this reason we so frequently direct attention to everything which comes under our cognizance that has a bearing upon its improvement. If this homogeneous metal is so valuable to the arts, and embraces such important advantages over other kinds of iron, its manufacture in our country should not be delayed for a single month longer.

Making Bread by Machinery.—Berdan's Patent Automatic Oven, &c.

It is somewhat remarkable that up to the present time, when almost every want of civilized man is supplied by machinery, the manufacture of bread—the first of all necessaries, the "staff of life"—should be almost universally carried on in as rude a manner as by the ancients. It is true that the primary process of converting the grain into flour may be said to have arrived at perfection, but beyond this, the manufacture, as generally practiced, differs little from what it was in the days of Moses. The subject has, however, within the last few years, attracted much attention from scientific and ingenious men, both in this country and in Europe, and it now seems that this most important of all the useful arts is to be no longer behind those which minister to our other wants.

A mechanical bakery has just commenced operation in Philadelphia, the ovens and machinery of which are the invention of H. Berdan, of New York city, which is capable, when worked up to its full capacity, of converting into bread the enormous quantity of 1,000 barrels of flour daily, estimated sufficient to supply the entire population of the Quaker City. By the immense saving of labor, fuel and space, the bread can be supplied from this establishment to the consumer, at a cost very greatly below that charged by bakers, and even cheaper than it can be made by families, purchasing their flour at retail. A brief description of this immense concern will, doubtless, be interesting to the majority of our readers, though it would require engravings to give anything like an adequate idea of it.

The building is four stories high, to the uppermost of which the flour is conveyed in the barrels by a hoisting apparatus, and after being turned out of the barrels, is sifted by suitable machinery, and afterwards conveyed into a large hopper belonging to the kneading machine, which is on the floor below. This machine is composed of a horizontal cylinder, in which rotates a bar for stirring the flour, water and ferment together, a scraper for preventing the adhesion of the dough to the cylinder, and a "flopper," which cuts into and opens the dough, takes up several hundred pounds of it at a time, and throws it about in a most remarkable manner, somewhat imitating, on a large scale, the operation of kneading by hand, causing much air to enter into it and be retained within it distributed in small cellules, and making the bread very light, with a small quantity of yeast. From this machine the dough is conveyed to the hopper of the loaf-making machine, the principal portion of which is on the second floor. This machine cuts or molds the dough into loaves, and registers the number made. The molds or cutters of the last-mentioned machine are variable, to enable the loaves to be varied in size exactly in proportion to the market price of flour. The loaves, after being formed, are carried off by an endless apron to a convenient point, to be taken by attendants and placed on brick-bottomed cars, on which they are passed into the ovens and baked. The ovens, of which there are two, are upright, and occupy comparatively little horizontal area. They are independent of each other, and each complete in itself, containing a system of upright endless chains, which are constantly in motion, to convey the bread from one door of the oven on the second floor of the building, where the bread is introduced, down to a door on the first floor, where it is discharged when sufficiently baked; the time occupied in its descent being just sufficient for the baking process, which is made continuous for any length of time, by the introduction of new supplies as fast as the discharges take place, the oven being thus kept constantly filled with the bread at progressive stages of the baking process. While the baking bread is passing down the oven on one side, the cars which have been emptied on the first floor and introduced at another door on the same floor, are passing up through the oven on the opposite side to a door on the second floor, where they are discharged, to be re-loaded and introduced at the first-named door again. There are four doors in all, two on the first, and two on the second floor. The endless chains of the ovens are made with rails, on which the cars run in and out. The doors are opened one at a time, at proper intervals, for the admission and exit of the cars, which are drawn into and expelled from the oven, and moved from the discharging to the receiving doors outside the oven all by machinery; and the only manual labor in the whole establishment is that of loading and unloading the cars. The oven is built entirely of brick, and the cars on which the bread is baked are, with the exception of light iron frames, made entirely of brick. Of the advantage of brick ovens it is needless to speak. The ovens are heated by fires which are tended in the basement of the building.

This bakery, which is the property of a joint-stock company, composed of some of the most influential men in Philadelphia, is one of the most perfect manufacturing establishments we have ever seen; and its machinery works with the precision of a clock. We had the pleasure of witnessing its operation on the opening-day, which was celebrated last week by a public *déjeuner* within its walls, at which some of the most distinguished men of the city were present; and in the speeches that were made on this occasion, Mr. Berdan received some very flattering compliments, to which he replied with great feeling and good taste.

The oven and kneading machine have both been patented through the Scientific American Patent Agency is this country, and in almost every country where patents are granted. Bakeries on the same principle are now in course of construction in New York, Boston, Baltimore, New Orleans, and other large cities; and it is hardly venturing too far to predict that similar concerns will be started, and come into successful operation, in every city of the Union, for cheap and pure bread is one of the greatest desiderata in large communities.

The Tele-stereoscope.

The stereoscope is an instrument which, from two pictures taken at different angles, presents to our view objects at a short distance in the solid form. Common pictures have a flat, dead appearance; stereoscopic pictures stand out in life-like relief. The reason of this is that, with the stereoscope, each of our eyes obtains a somewhat different view of the object, and they find the true form of it out of the two perpective views or pictures taken at different points. If, however, the distance from which we view the pictures in the stereoscope is considerable, the eyes are too slow in their action to enable the observer to form a correct idea of the distance and the form of the object represented, unless some very favoring circumstances of light and shade assist in doing so.

Ranges of distant mountains generally appear to the naked eye like perpendicular walls attached to the firmament. In the stereoscope, it is possible to combine two perspective views of a landscape taken from two different points sufficiently distant so as to give the observer a correct idea of the real or true forms embraced in the views. A stereoscopic picture, therefore, conveys a more perfect representation of a landscape than an observation made with the naked eye. It is only by changing positions, and thereby obtaining different perspective views of a landscape, and by comparing these views, that an observer is enabled to perfect his observations, and to obtain something like a correct idea of the forms of the objects embracing the scene. If the observer could take different views of a landscape at the same moment, the scene presented to his vision would be charming and life-like. But this he cannot do, neither can it be done with the common stereoscope for distant objects; but in *Dingler's Polytechnic Journal*, published at Augsburg, Germany, it is stated that this is accomplished by a simple instrument called the "tele-stereoscope," recently invented by M. Helmholz. It consists simply of a smooth board, four feet long, on each end of which a looking glass is fastened perpendicular to its plane, and making an angle of 45°, with a line drawn longitudinally through the center of the board. In the middle of the board, two other smaller looking-glasses are fastened parallel to the first two, and so close together as to enable the observer to look at once with an eye into each. If it is desirable to magnify the object, an opera glass or spectacle lens may be inserted between the eye and the looking-glasses. By these means the right eye sees the landscape as it appears in the looking-glass at the right end of the board, while the left eye sees it as it appears on the looking-glass at the left end. The distance of the observer's eyes is increased by these means from about three inches (the common distance) to four feet, and he thereby obtains a view which as far surpasses stereoscopic photographs as an oil painting excels an engraving. The journal referred to also states that objects distant from one to two miles appear correct in the back ground, and nearer objects very perfect, particularly trees, the limbs and branches of which are distinctly separated, and the whole landscape stands out solid and beautiful.

Gomez & Mills' Safety Fuse.

Last week, at the New York State Arsenal, we were present during a series of experiments with the above fuse. It is a peculiar chemical composition, enclosed in a paper case and wrapped round with cotton, and for land service it is passed through tar to render it impervious to rain and the dampness of the ground, but for submarine purposes it is coated with gutta percha. It is of flat form, and in consequence not so liable to injury as the ordinary round miner's fuse. The fire passes through this fuse at the rate of one mile in four seconds; and one of the experiments consisted in firing two guns, the one with a length of about fifteen feet of fuse, and the other with about two hundred feet, both lighted at once, and from our position on the steps of the arsenal, each seemed to go off at the same moment. The fuse is inserted in the cartridge, and passes through the mouth of the gun to the hand of the gunner, so that an enemy spiking a gun does not render it any more unfit for service than it was before. One man can fire a battery of any number of guns at almost the same instant with this fuse, and it is without doubt a great and valuable addition towards that perfection of the art of war which shall ensure universal peace.

This invention was recently tried with success at Washington, under the personal direction of the Secretary of War.

Water in the Sea.

If we would obtain any idea of the water which the sea contains, let us suppose a common and general depth for the ocean; by computing it at only two hundred fathoms, or the tenth part of a mile, we shall see that there is sufficient water to cover the whole globe to the height of 503 feet; and if we were to reduce this to one mass, we should find that it would form a globe of more than sixty thousand miles in diameter.

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Earth and Ocean Temperatures.

As we descend into the interior of the earth the temperature gradually increases. In mines, and during the sinking of artesian wells, it has been constantly observed that, at a certain distance from the surface, a point is attained at which the heat of summer and the cold of winter produce no effect upon the temperature; and beyond this point the heat augments in a regular ratio of 1° Fah. for every 55½ feet of descent. It is true that this increase of heat is not uniform in every part of the earth, as it differs in different strata at the same depth from the surface, but this variation is so small as not to affect the general rule. Reasoning from this data, geologists naturally conclude that at the depth of say 200,000 feet, the temperature must be 3,600°—a heat which must keep all the materials in the center of the earth in a state of fusion. It is, therefore, taught by many, that the center of the earth is a fiery mass, and that the globe's solid crust does not amount to more than a fiftieth part of its diameter. But if this is a law or rule regarding the solid parts of the earth, the contrary seems to be the case with the fluid portions of it. Lieut. Berryman, U. S. N., in his deep sea soundings, seems to have eliminated a totally opposite law reigning in the ocean, viz., that the cold increases according to the depth; and in connection with this other remarkable phenomena. He says:—

"Five hundred miles north of Bermuda we found the greatest reliable depth ever obtained, it being over four miles; and accompanying this were thermometrical observations of a singular character, indicating phenomena never before discovered or conceived, and which at this moment are an unsolved problem to the scientific world. In a long series of experiments the temperature was indicated as existing ten, fifteen, and twenty degrees below the freezing point. This may be owing to the defective instruments; but if so, a consistency of error was preserved almost beyond the possibility of chance."

The records of these deep sea soundings go to contradict the well-known and established law that water freezes at 32° Fah.; also that there is one law relating to temperatures for the ocean and another for the dry land. There must have been some defect in the instruments referred to, which indicated an ocean temperature below the freezing-point, or else the stratum of fluid reached at the great depth mentioned was not common salt water, but some other fluid, incapable of freezing, except at a much lower temperature. We do not believe, however, that any such fluid exists where these deep sea soundings were taken.

The Vine Disease.

This disease, which has ruined the crops of the vine-growing countries of Europe, is at last conquered. Mr. Kyle, a Scotch gardener, has discovered that the application of sulphur to the plant is an effectual preventive and remedy. Of such importance had this disease become to France, that the Society for the Encouragement of Agriculture offered a prize of $2,000 for a cure, and many smaller ones for researches on the subject. This first prize has been divided between Messrs. Kyle (who was also awarded the $100 gold medal of the Society), Duchartre, Gouties, and Maris. M. Barral, in his report to the Council, makes the following remark:—"It was England who inoculated the vine disease into Europe, but it is remarkable that it was in that country that it was most perfectly studied by Mr. Berkeley, and again in the same country that a cure was discovered by Mr. Kyle."

In this country, and especially those parts of it where the vine is cultivated, it ought to be recollected that it should be studied as well as nurtured, and that, like every other plant, the more care and attention that is paid to its growth, the more abundant and luscious will be its fruits. It is not enough that our soil is so rich that it will grow luxuriantly without much care. We yet ought to pay attention to it to produce still more luxuriance.

Lieut. Maury in the Navy.

"Lieut. Maury, who has been physically incapacitated for naval service by a broken leg, having been restored to rank by the Naval Courts, other officers now demand that he either be sent to sea, or got out of the way of their promotion by resignation."

We copy the above paragraph from an exchange, and we hope, for the honor of the country, that the last statement is not true. Lieut. Maury is an ornament to his country, and we rejoice that he has been restored to rank by the Naval Courts, and that he will neither resign nor get out of the way, to make room, perchance, for some lazy, worthless fellow, who might disgrace the American navy. Lieut. Maury has done more to promote nautical science than any man now living, and hence we urge that he should be retained just so long as he lives. If he is incapacitated to do physical service because of a lame leg, his head is not broken, and by the aid of its workings he can do quite as much as can those who would supplant him, by the combined power of their legs and all their other qualifications. Nelson, when he achieved his greatest victory, was blind of an eye, and had only one arm.

The Stubborn "Leviathan."

The talk and the writing about the launching of this vessel have now become leviathan-like in dimensions. We wait with patience for the period when we can say, "like leviathan afloat, lay her bulwarks on the brine." By the latest news from Europe, five attempts at launching had already been made and failed, and further operations are suspended for a long time to come, on account of the breakage of chains and hydraulic pumps employed to move her. No less than three hydraulic rams, one powerful windlass, and the double chains which drag the vessel towards the river have all been burst or broken. She still sticks on her ways, at two-thirds the distance from where she was built. The London *Times* states it will cost $500,000 to launch her; the London *Engineer* says it has cost $350,000 already, and as it has to be moved twice the distance it has already traversed, it may cost more than $1,000,000. Just think of one million of dollars being expended upon launching this monster! What in the name of common sense possessed its builders to construct her at such a distance from the water?

Circle of the Scientific Press.

France, with her accustomed energy in the cause of science, has made another great step forward, by the forming of a new society under the above title, and which is to consist of members of her scientific press, who, at their meetings, will discuss the inventions and discoveries of the past month, in every branch of science and art, and lay before the world the results of their discoveries. At their first meeting in Paris, on the 16th of November last, they were presented with a full account of the submarine tunnel to connect England and France, by the designer, M. Thomé de Gamond, and after an animated discussion it obtained their approval. Many inventions were then exhibited, such as a watch which will give the correct hour at any meridian, a way-measurer for vehicles, and many articles of *vertu* and interest. We look with great hope to the future of this society, comprising, as it does, among its members, the chiefs and subordinates of a scientific literature which is the most *purely* scientific, although not perhaps, the most practical, existing in any country in the world.

The Black Hills.

There are some sections of our extensive country almost as little known as the interior of Africa. The St. Louis (Mo.) *Republican* states that a party has just recently returned to that city from an exploring expedition in a wild region known by the above appellation. It is a vast country of movable sands, sterile, bleak and inhospitable. There are small streams at remote distances in it, upon which there is spare vegetation; sufficient, however, for the subsistence of the Indians' horses and some buffalo. It must ever be the home of nomadic tribes, who wander about like those of the wild wastes of Asia in search of the small patches of pasturage which are fructified by the irrigation of distant rivulets. This country has been supposed to be fertile from its geographical position and its appearance upon the map, but it proves to be wholly otherwise. The party consisted of sixty men, and the Sioux, who are numerous there, forbid the return of any more white men. They said that this party might pass, because it was the first, but no others must come, as they scared away their game, and would discover their strongholds and hiding-places.

Quack Names for Burning Fluids.

A correspondent writing to us from Fall River, Conn., states that a burning fluid called "Helion Oil," has recently come into extensive use in that city, and he asks if it is one of those fluids liable to explosions, which we described lately in an article in our columns. We have had other inquiries of a similar character relating to a fluid called "Excelsior Oil." Not having seen the oils which have received such names, we cannot tell what they are, but we suppose they are coal oils with flashy names to astonish the marines. All such fluids should receive their true name in connection with that of the manufacturers, such as "Breckenridge Coal Oil," "Newark (Ohio) Coal Oil," &c. The quality of the oil will thus become an advertisement to the manufacturers, and incite them to make improvements, in order to excel one another in producing the best and cheapest article.

Vocal Machinery of Birds.

It is difficult to account for so small a creature as a bird making a tone as loud as some animal a thousand times its size; but a recent discovery has shown that, in birds, the lungs have several openings communicating with corresponding air bags or cells, which fill the whole cavity of the body from the neck downward, and into which the air passes and re-passes in the progress of breathing. This is not all. The very bones are hollow, from which air pipes are conveyed to the most solid parts of the body, even into the quills and feathers. The air being rarified by the heat of their body, adds to their levity. By forcing the air out of the body, they can dart down from the greatest hights with astonishing velocity. No doubt the same machinery forms the basis of their vocal powers, and at once resolves the mystery into a natural ordering of parts.—*Gardner's Music of Nature.*

Preserving Railroad Timbers.

Messrs. Editors—I would suggest a cheap plan for increasing the durability of railroad ties and other timbers in exposed situations. Make a cheap long tank, with a furnace under it, and place it on a railroad car. Fill it with coal tar, (which can be obtained at any of the gas works for $1 50 a barrel,) and bring it to a boiling heat. Now introduce a set of ties or timbers, and boil them for a short period, raising them up and down, by some simple contrivance, four or five times, when undergoing the operation; then take them out, and allow them to dry for a few days. It will require but a short time to prepare timbers in this manner, and the cost is not worth naming, in comparison with the durability imparted to them over those laid down in their natural condition. One set of tar-prepared ties will last three times longer than an unprepared set. Fence-posts should also have their ends which enter the ground treated in this manner. J. Scotton.

Newark, Ohio, January, 1858.

[Our correspondent is perfectly right in his conclusions respecting the advantages to be derived from this mode of treating railroad timbers. The only objection to the process is the handling of dirty sticky timbers; but that is of no consequence while plenty of persons can be found ready to do the work.—Eds.

Preparing Liquid Glue.

Messrs. Editors—The following is a method by which I have prepared liquid glue, and have found it very convenient:—

Take the glue in any quantity desired, and dissolve it in as small a portion of boiling water as possible; it will then be found too thick for use. While it is still hot, take the glue-pot from the fire, and reduce or thin the glue to the proper consistency with alcohol; then put it in a bottle, the mouth of which must be covered with india rubber or other material impervious to the air.

Liquid glue made in this manner, and placed in bottles, may be kept ready for use for a number of years. I have some glue which I now use that was thus prepared six years ago, and is as good as when newly made. It only requires to be slightly warmed for application during cold weather.

Merchant Kelly.

Bentonville, Ind., Dec., 1857.

[This is a very good method of making glue for use where only a little is required, and that but at considerable intervals of time. Liquid glue is very liable to rapid putrefaction in warm weather, and it freezes in cold weather. Alcohol preserves it from both of these influences. A bottle of liquid glue is very convenient for use in families to mend broken chairs and other pieces of furniture.

Cure for Chapped Hands.

Messrs. Editors—I have seen in a late number of the Scientific American directions for curing chapped hands. I have used the following for many years, and have recommended it to a number of friends, and wherever it has been used, the result has been all that could be desired:—

Take two ounces of glycerine, and one ounce of rosewater, mix, and rub your hands well with it before retiring to rest. It is pleasant, agreeable, and cleanly, and its effects are truly wonderful; indeed, whatever business a party may be engaged in, it will not fail to effect a cure. The glycerine alone is equally as good, but the rosewater is more pleasant to use. William Nash.

Branford, Conn., January, 1858.

Destruction of Models.

Periodically—at the end of every six months or so—it becomes imperatively necessary that we should destroy or otherwise dispose of such models as have been sent to our office for examination, have been declared by us to be not patentable, have then remained uncalled for by their inventors, and have consequently accumulated in our possession. As the commencement of a new year is a period of general cleaning-out and brushing-up in every well-ordered establishment, and constitutes one of the above-mentioned epochs of destruction in our own, we hereby notify all inventors wishing to preserve those of their models which have now lain long in our hands, that they must order them away immediately.

The best of the models of unpatentable devices are retained by us, discretionarily, even if they have been in our possession as long as six months; but we do not keep such as have been so poorly constructed as to be not worth the expense of carriage homeward to their owners, and we do not hold ourselves accountable for any model which has been stored in our office longer than six months.

The above remarks equally apply to all models which have been sent to us for the purpose of having engravings prepared from them.

Of course, it is almost unnecessary to add that we most carefully preserve all such models as we have received with positive instructions to make applications for patents thereon, and that such are forwarded to the Patent Office at Washington at the earliest opportunity.

Finally, we again admonish all who wish to save models which have been long lying in our office, that they must quickly order them to be boxed up and shipped to their respective owners; or otherwise, by and by, the latter will wish to have their models when restitution will be an impossibility.

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Correspondents

F. N. B., of Wis.—Copper is superior to iron wire as an electric conductor, because it offers less resistance to the passage of the force. The coarse copper wire in the the helix is composed of several strands connected together. Iron wire is not suitable for a helix, because of its great resistance. Pure copper wire for making a ribbon coil is superior to tinned copper. The finer the wire, and the more numerous the convolutions, the more powerful will be the electro-magnet.

S. H. J., of Md.—In making surveys, you should do so upon a meridian established by your own observations; but in making reports of your labors you should state this clearly, so that the difference between your results and the map, where it is established authority, may be made known.

J. W. C., of N. Y.—We have received your sketch and description of a propeller to be operated by a reciprocating motion, and to open and close like a duck's foot. This kind of propeller is older than the paddle wheel, and was invented by the Marquis of Worcester. You will find it illustrated in Vol. 5, SCI. AM.

F. H. H., of N. Y.—The plan you propose to launch the "Leviathan" is simply a dry dock. It would have been more to the credit of her designer and builder had they built such a dock before commencing her construction; but that is out of the question now. M. Brunel undoubtedly expected he could accomplish the launch more easily.

F. A. L., of N. Y.—As a substitute for coal tar to paint wooden posts and sills, where these enter the ground, use a paint composed of boiled linseed oil, asphaltum, and red lead; its color will be deep brown. Introduce about three pounds of ground asphaltum into every gallon of oil, when boiling, and stir until it is dissolved, and then add red lead slowly, until the paint attains to the proper consistency for putting on with a brush. This paint is a good protection, but not quite equal to coal tar; but it soon dries, and the posts can be handled freely, which is not the case with the tar, as it does not dry, has a very offensive odor, and a disagreeable appearance.

H. H., of Pa.—The sample of mineral you sent us for examination appears to us to be a slaty shale; we do not think there is much, if any, carbon in it. But this you can easily try for yourself, by placing it on a fire, and if it only becomes red-hot, without burning, you may be sure it is of no use. It is rather like an inferior slate found in this State.

E. D. T., of Ky.—Good concrete wall is made with common mortar and small stones. We cannot recommend such a wall for building purposes; it answers very well for some situations underground, in which cases hydraulic cement is employed for an outside coating.

J. R., of N. Y.—An engine of 12-inch bore, 16-inch stroke, and making 130 revolutions per minute, will require more steam than one of 10-inch bore, and 24-inch stroke, making 80 revolutions per minute, but it will give out more power. We would prefer the engine with the proportions of 10-inch bore and 24-inch stroke, if it is of sufficient size to do your work. Its valves do not require to be opened and closed so frequently as the one which makes a greater number of revolutions.

J. McM., of Ky.—A current of electricity does not produce an explosion when passing through free space, or on a good conductor. An explosion by electricity is caused by the passage of a current through a resisting medium. You cannot form a vacuum behind and before the piston in a cylinder by alternately heating a piece of spongy platinum at each end with a galvanic current. An explosive engine, with the use of gun cotton as the agent, is far inferior to a steam engine in every sense. Do not waste time and money in such experiments. See our opinion given to another correspondent, on the same subject, in No. 18, this Vol., SCI. AM.

J. P., of La.—A whitewash made by adding to each bushel of lime, one pound of the sulphate of zinc is excellent for outhouses.

F. B., of Ala.—Any overshot wheel made of wood will soon go to wreck if the stream that drives it becomes dry during a part of each year. This is owing to the nature of the materials of which it is made. Were it entirely constructed of iron, it would endure much longer, but it is more expensive.

J. H. W., of Iowa.—The cheapest and best ice-house which you can erect is simply a frame building, well boarded up inside and outside, in roof and sides, so as to leave a space between the boards, which should be stuffed with a good non-conductor, such as charcoal dust, dry sawdust, or if you cannot obtain these, use straw. Build the house above ground, and with a drain under the floor. This plan is simple, and the cost will be small.

E. R. B., of Conn.—In general a patent for a new article of manufacture covers the thing made as the specification describes. For example, a patent as a new article of manufacture for a pen-holder composed of gutta percha, would cover the making of pen-holders of the gum named. But it would not cover the making of any other article, nor the use of any other material. The value of a patent of this character depends upon the nature of the invention and upon the specification. In the supposed case, namely, mechanism wholly new, it might be better to claim all the new features separately.

B. F. B., of Pa.—The best cement for iron and wood is a mixture of whiting, linseed oil, red lead and pounded glass which forms a hard and durable cement.

H., of N. Y.—There is no special rule for coloring mechanical drawings, as nearly every draughtsman employs some method of his own. All drawings should contain more or less color, and the idea is not peculiarly French.

T. W. B., of Ohio.—We do not consider it profitable to encumber our columns with abstruse mathematical questions which should be learned at school. Our objects are rather to eliminate the results of the sciences as applied to arts in general, without undertaking to instruct in the more elementary principles. It is an error to suppose that "the books" do not contain the information you seek to promulgate. In Davidson's great work, out of which our small treatises are made, every difficulty in mathematics is touched upon, and the Encyclopedia Metropolitana has a still more elaborate treatise covering the whole ground.

A. M. G., of Phila.—Many tinsmiths make their own spelter, by using half lead and half block tin. Melt the lead first in an iron vessel, then add the tin. When the two metals are melted and mixed together, run them out into molds. Phelps, Dodge & Co., this city, are large importers of spelter.

J. W., of N. Y.—There is a boring tool which would answer your purpose, but we can only give you an idea of it by drawings.

A., of R. I.—Nearly every sculptor uses a different clay for his modeling; but we cannot recommend you to a better than to take fine powdered clay, mix with it a little whiting, and work to any consistency you wish. The best work on anatomy, for young artists, is Wilson's; it is an English book, and published in this city by D. Appleton & Co.

F. D., of N. J.—We cannot give you the inventor's name, nor tell you how the article referred to is prepared.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, January 9, 1858 :—

J. L., of Tenn., $25; C. & M., of Iowa, $35; L. B. S., of Conn., $25; W. H., of N. Y., $30; I. H., of N. Y., $30; G. S. C., of Ill., $30; H. R., of Ind., $30; A. L., of Conn., $30; C. V. W., of Mass., $30; H. & J. S. B. N., of Maine, $30; H. P., of Pa., $55; J. K. B., of N. Y., $25; C. H. E., of Wis., $10; J. A. & F. D., of N. Y., $30; W. & C., of Conn., $30; T. R., of Pa., $55; O. L. C., of Ill., $115; M. V. A., of N. Y., $50; C. & Q., of Mass., $25; H. A. W., of N. Y., $30; J. H., of Ill., $25; A. C. R., of Conn., $25; G. D., of Pa., $25; J. S., of Ind., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, January 9, 1858 :—

L. S. C., of N. Y.; J. C., of Mass.; C. C., of Pa.; J. J. A., of N. C.; J. L., of Tenn.; E. L. E., of R. I.; W. L. C., of Va.; R. H., of N. J.; C. J. R., of Md.; M. W., of N. Y.

TO OUR SUBSCRIBERS.

RECEIPTS—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of the receipt of their funds. The Post Office law does not allow publishers to enclose receipts in the paper.

BACK NUMBERS.—After the 1st of January, we shall commence sending the SCIENTIFIC AMERICAN to new subscribers from the time their names are received, unless the person ordering expresses a desire to receive the back numbers, in which case complete sets will be furnished from the commencement of the volume.

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Twenty-five cents per line each insertion. We respectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

*** All advertisements must be paid for before inserting.

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TO MILL-OWNERS MILLERS, AND Mill-wrights in the South and Sourth-west.—Having received the Agency for the Southern States for an improved merchant Flouring Mill and a Bolting Apparatus, made of gauze wire, together with the best Smut Machine in use, orders are solicited for the same. Address LANGLEY & CO., Patent Right Agents, care Mechanics' Institute, Nashville, Tenn.

FOR SALE—A SECOND-HAND ENGINE, Boiler, and Blowing Cylinders, suitable for a foundry or furnace. Cylinder, 7 by 32 inches, on iron bed. Boiler, 40 inches by 26 feet, double flues. Three blowing cylinders, each 16-inch bore, 39-inch stroke, with all the castings, bolts, timbers, pipes, gearing, breeching, &c., necessary to set running. Cost $1,600, and though nearly as good as new, will be sold for $1,300. We sell it for no fault, but simply because we have no use for it. Also one second-hand engine, with 10 by 30-inch cylinder. JAS. A. HAVEN & CO., 177 Second st., Cincinnati, O.

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IMPORTANT TO INVENTORS.

THE RAPID GROWTH OF OUR PATENT Agency business during the past three years has required a great addition to our ordinary facilities for its performance, and we are now able to announce the completion of a system which cannot fail to arrest the attention of all who have business of this kind to transact.

OUR PRINCIPAL OFFICE

will be, as usual, at No. 128 Fulton street, New York. There is no other city in the Union so easy of access from every quarter as this, consequently there are greater advantages in regard to the transmission of models, funds, &c., through the various channels that center in New York. Two of the partners of our firm reside here, and during the hours of business are always at hand to counsel and advise with inventors. They are assisted by a corps of skillful Examiners, who have had many years of active experience in the preparation of cases for the Patent Office.

To render our Patent Agency Department complete in every respect, we have established a

BRANCH OFFICE IN THE CITY OF WASHINGTON,

on the corner of F. and Seventh streets, opposite the United States Patent Office. This office is under the general care of one of the firm, assisted by experienced Examiners. The Branch Office is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

A SPECIAL NOTICE.

We especially require that all letters, models and remittances should be made to our address at New York.

EXAMINATION OF INVENTIONS.

We have been accustomed from the commencement of our business—twelve years since—to examine sketches and descriptions, and give advice in regard to the novelty of new inventions, *without charge*. We also furnish a printed circular of information to all who may wish it, giving instructions as to the proper method which should be adopted in making applications. This practice we shall still continue, and it is our purpose at all times to give such advice free and candidly to all who apply to us. *In no case will we advise an inventor to make application unless we have confidence in his success before the Patent Office.*

Our extensive experience in mechanical and chemical improvements enables us to decide adversely to nearly one half of the cases presented to us for our opinion, before any expense has occurred in the preparation of the case for a patent.

When doubt exists in regard to the novelty of an invention, we advise in such cases a

PRELIMINARY EXAMINATION

to be made at the Patent Office. We are prepared to conduct such examinations at the Patent Office through our "Branch Agency," upon being furnished with a sketch and description of the improvement. Our fee for this service will be $5.

After sufficient experience under this system, we confidently recommend it as a safe precautionary step in all cases before application is made for a patent—not that there will be no rejections under this system. It is impossible to avoid such results in many cases, owing to the exceedingly wide range taken by the Examiners in the examination of cases; but, nevertheless, many applicants will be saved the expense of an application by adopting this course. Applicants who expect answers by mail must enclose stamps to pay return postage.

THE COSTS ATTENDING AN APPLICATION

for a patent through our agency are very moderate, and great care is exercised in their preparation. No cases are lost for want of care on our part in drawing up the papers, and if the claims are rejected, we enter upon a speedy examination of the reasons assigned by the Commissioner of Patents for the refusal, and make a report to our clients as to the prospects of success by further prosecution.

A circular containing fuller information respecting the method of applying for patents can be had gratis at either of our offices.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of their case, enclosing the official letters, &c.

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We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard Saint Martin, Paris; and 3 Rue Theresienne, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information sent free on application.

☞ Remember the SCIENTIFIC AMERICAN PATENT AGENCY, No. 128 Fulton street, New York. MUNN & COMPANY, Proprietors.

The annexed letter from the late Commissioner of Patents we commend to the perusal of all persons interested in obtaining patents :—

MESSRS. MUNN & CO.—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

Yours, very truly, CHAS. MASON.

ALCOTT'S CONCENTRIC LATHE—THIS Lathe is capable of turning under 2 inches in diameter with only the trouble of changing the dies and patterns to the size wanted. It will turn smooth over swells or depressions of ¾ to the inch, and works as smoothly as on a straight line, and does excellent work. Price $25, (without frames,) boxed, and shipped with directions for setting up. For sale by MUNN & CO., 128 Fulton street, New York City.

PORTABLE STEAM ENGINES.—S. C. HILLS, 12 Platt street, New York, offers for sale these Engines, with Boilers, Pumps, Heaters, etc., all complete, suitable for printers, carpenters, farmers, planters, &c. A 2½ horse can be seen in store; it occupies a space 5 by 3 feet; weight, 1,500 lbs.; price $240. Other sizes in proportion.

CLOCKS.—TOWN CLOCKS OF ALL SIZES also Regulators for Jewelers, Railroad Offices, &c. believed equal to any made. Dials for illumination. VOSBURGH & CO., Agents. 122 Liberty street, New York. JOHN SHERRY, Manufacturer, Sag Harbor, N. Y.

SWISS DRAWING INSTRUMENTS—A full stock of these celebrated instruments always on hand. C. T. AMSLER, (formerly Amsler & Wirz,) Philadelphia, Pa.

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STEAM ENGINES, STEAM BOILERS, Steam Pumps, Saw and Grist Mills, Marble Mills, Rice Mills, Quartz Mills for gold quartz, Sugar Mills, Water Wheels, Shafting and Pulleys. The largest assortment of the above in the country, kept constantly on hand by WM. BURDON, 102 Front street, Brooklyn, N. Y.

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CAUTION TO THE IRON TRADE IN AMERICA—Richard Cort, the surviving son of the late Henry Cort, the great inventor of puddling, piling or balling, heating and rolling, for the manufacture of bar iron, begs to inform the Iron Trade of America that no other person besides himself has any authority whatever to collect funds for the Cort testimonial. Others are attempting to do it without any authority. Richard Cort's address is No. 26 Fleet st., London.

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WELCH & GRIFFITHS—ESTABLISHED 1830—Manufacturers of Improved Patent Ground and Warranted Extra Fine Cast Steel Saws, of the various kinds now in use in the different sections of the United States and the Canadas, and consisting of the celebrated Circular Saw, Graduated Cross Cut and Tenon, Gang, Mill, Pit, Segment, Billet and Felloe Saws, &c., &c. For sale at their warehouse, No. 48 Congress street, Boston, Mass.

AGENTS WANTED IN ALL THE CITIES and towns throughout the United States, to sell Wright's Patent Sectional Spring Bed Bottom. Address W. WRIGHT, No. 102 West Fortieth street, New York City.

OIL! OIL! OIL!—FOR RAILROADS, STEAMERS, and for machinery and burning. Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer, F. S. PEASE, 61 Main st., Buffalo, N. Y. N. B.—Reliable orders filled for any part of the United States and Europe.

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VAIL'S SPEEDWELL IRON WORKS, Morristown, N. J., manufacture Craig's Patent Double-acting Balance Valve Oscillating Steam Engines both stationary and portable, Knowles' Patent Muley, Portable, Gang and Re-sawing Mills, Sugar and Chinese Cane Mills and Sugar Pans, Grist Mills, Mill Irons, Rich's Water-wheels, Forgings and Castings. Orders for the above, and all descriptions of labor-saving machinery will receive prompt attention. JOHN H. LIDGERWOOD & CO., No. 9 Gold street, New York.

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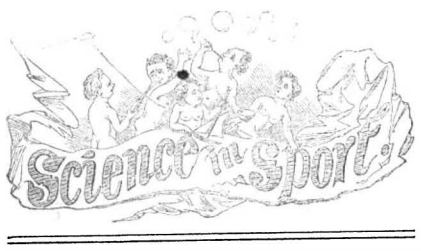
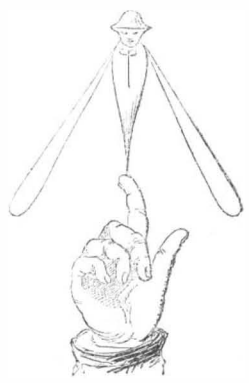


One more illustration on the subject of gravity, and we leave that branch of physics for the present, not that there is any lack of illustration, but because there are so many other subjects which we have to place before our juvenile readers.



The above little figure may be made to balance itself amusingly. Get a piece of wood about two inches long; cut one end of it into the form of a man's head and shoulders, and let the other end taper off to a fine point. Next, furnish the little gentleman with a pair of wafters, shaped like oars, instead of arms; but they must be more than double the length of his body; stick them in his shoulders, and he is complete. When you place him on the tip of your finger, if you have taken care to make the point exactly in the center, he will stand upright, as seen in the engraving. By blowing on the wafters he may be made to turn round very quickly. It is explained by the reasons that were given in our last number.

This little machine consists of three vanes, the form of each being the segment of a circle, the obliquity of whose surface increases as it recedes from the center of motion. The flyers are attached to a spindle, which fits loosely in the stand, and around it is wound a string, like that around a humming-top. If this string be suddenly pulled, a powerful rotary motion will be given to the vanes or flyers,

and from being set at an angle they will cut the air obliquely, consequently a reaction takes place; and if the weight of the flyers and spindle be less (as it should be) than the force of the reaction, it ascends, whirling its way upwards, like a bird, into the sky. If it be made to spin in a room, it rises to the ceiling, and spins around on the ceiling for some time. It is a highly amusing and instructive toy, as it is on the same principle that birds fly; or perhaps its action is more like that of the screw propeller in the water, and it might justly be called an ærial propeller. If we are ever able to travel in the air by means of balloons, it will be by the aid of some such contrivance as this, although we think that that day is very far distant.

To Show the Pressure of the Atmosphere.

Invert a tall glass or jar in a dish of water, and place a lighted taper under it; as the taper consumes the air in the jar, its pressure becomes less on the water immediately under the jar; while the pressure of the atmosphere on the water *without* the circle of the jar remaining the same, part of the water in the dish will be forced up into the jar, to supply the place of the air which the taper has consumed. Nothing but the pressure of the atmosphere could thus cause part of the water to rise within the jar above its own level.

Tinning Cast Iron.

Vessels for cooking and other purposes, commonly called "tin-ware," are in general use, because they are so cheap, cleanly and strong. The material of which they are composed is sheet iron coated with tin. The latter metal adheres so tenaciously to cleaned wrought iron that it is almost impossible to separate the two metals; hence the iron, otherwise so liable to corrode, is almost perfectly prevented from rusting. Sheet tin can now be spun in the lathe into cheap vessels of various forms; still there is a variety of forms of cheap articles which can only be made of cast iron, and they would come into more extended use, were some method discovered for tinning them, it being a curious fact that while tin will adhere tenaciously to wrought iron, it has no affinity at all for cast iron. Various efforts have been made to tin cast iron, but they have generally been unsuccessful. It is true that the interior of hollow cast iron ware is generally tinned, but this coating is not very durable.

Quite recently, however, it is stated in some of our foreign cotemporaries, that M. Weinberger, of Paris, has succeeded in tinning cast iron, and rendering the tin coating as durable as on common tin-ware. For this purpose he subjects the cast iron vessels to a decarbonizing process, in the same manner that malleable iron is treated, by enclosing them in cases filled up with some decarbonizing agent, such as the red oxyd of iron, and then submitting them to a red heat for several days. Such vessels, after being decarbonized, are scoured clean with acid, sand and warm water, to remove all the oxyd, then they are submerged in molten tin in a vessel, having its surface covered with tallow, in exactly the same manner that sheet iron is tinned. This is a valuable and simple process for treating cast iron to be tinned, and may be carried on very extensively in our country, as the most suitable iron for the purpose is that made from charcoal, of which we have an abundance.

New Folding Scythe.

This scythe is constructed with several very valuable improvements. In the first place, the blade may be set at any required angle with the ground; secondly, the position of the blade with respect to the handle or snath may be altered and fixed in any position desired; and thirdly, the blade will fold and lie in a line with or be protected by the handle, for portability.

Fig. 1 of the annexed engravings represents the scythe complete and folded. A is the snath; B B are the handles mounted thereon; C is the blade, which has a portion of the heel, D, turned up at or about right angles to the blade; in the end of the turned-up portion, D, an eye is formed. The several parts are better seen in Figs. 2 and 3, which are different and detached views of the jointed parts. Fig. 3 is a plan of a portion of a scythe blade with the parts for fixing it to the snath attached thereto; Fig. 2 is a view of the same looking towards the heel of the scythe from behind. In this view the snath is represented by dotted lines, A. F is a quadrant-shaped piece of metal, which has a similarly shaped slot, G, formed in it. H is a portion of the quadrant piece; it is formed on and projects downwards from the quadrant, at right angles, or nearly so. In the projection, H, a hole is formed and tapped; a screw, I, is passed through the hole or eye in the heel part, D, of the scythe blade, and then screwed into the tapped hole in the projection, H, thus firmly securing these parts together. J is a pin or pivot formed on the quadrant piece, F. This pivot projects upwards and is inserted in a hole or eye in the plate, L. Through the slot, G, a screw, M, is passed, and is then screwed into a tapped hole formed in the plate, L. The plate, L, is placed in a recess formed in the butt of the snath, and is firmly and permanently secured thereto by bolts, screws and nuts, O O, which bolts are passed through holes in the plate, L, and through corresponding holes in the snath, A.

Fig. 1

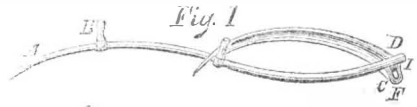


Fig. 2

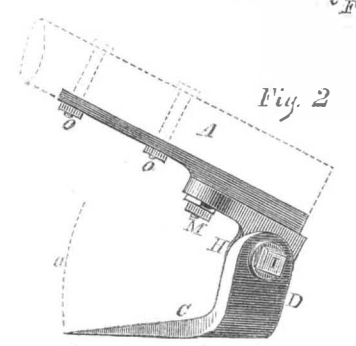
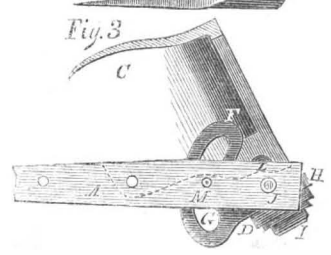


Fig. 3



To set the blade, C, in a proper position relative to the snath, A, and to the surface of the ground, the screws, I, and M, are unscrewed, the blade is then at liberty to be moved into the position required, when the screws, I and M, are tightened, and thus the snath and blade are secured as they have been set. Either the screws, I or M, may be made use of separately to set the blade, the screw, I, being made use of when a vertical movement is required, and the screw, M, for a horizontal, as represented by the dotted line, Q, in Fig. 3. When the scythe is not required for use, both the screws, I, and M, are unscrewed until the blade, C, is capable of receiving a vertical movement on the screw, I, and likewise the blade, C, and quadrant, F, a horizontal movement on the pivot, J. The blade, C, is then made to approach the snath, A; the screw, M, thus traverses in the slot, G, until the blade and snath assume the position shown in Fig. 1, when it is more easily and safely carried from one place to another, and also more readily stowed away.

We transcribe the above from the London *Mechanics' Magazine.*

Sugar-making.

Some recent improvements in the process of making and purifying sugars consist in applying to the juice a saturated mixture of alum and lime, in the proportion of two pounds of the mixture to a hundred gallons of the juice. These being intimately mixed, the acid is to be neutralized by the application of milk of lime, in the proportion of three pounds to a hundred gallons. If there be an excess of acid, it will be discovered by the application of the test paper usually employed by chemists to detect acids, and more milk of lime must be added; and if there be an excess of alkali, it may be discovered by the application of the test paper used for detecting alkalies, and more juice must be added. When the mixture ceases to affect either the test for acid or alkali, the impurities will be precipitated, and may thus be separated; and the juice thus purified is to be subjected to the usual mode of clarification and concentration. Pure raw sugar is now obtained direct from the sugar cane, without having undergone any subsequent process of decolorization or refining, prepared by effecting the last stages of the concentration of the cane juice in a vacuum, at a temperature insufficient to produce any chemical changes in its constituent parts. By this improved and scientific process of manufacture, no molasses or uncrystallizable sugar is formed, and there is, hence, an increase of 25 per cent. in the quantity of sugar obtained.

Literary Notices.

THE KNICKERBOCKER MAGAZINE for January, 1858. John A. Gray, New York.—This, the oldest of American monthlies, in commencing its fifty-first volume, starts well. "The Life of a Midshipman" is still continued, and seems to increase in interest as it progresses. A good sketch, entitled "John Bradshaw's Adventures in Smithburgh," enlivens its pages, while the "Editor's Table" is covered with all the riches of literary lore for the past month; and right pleasantly does the editor carry the reader through these realms of printed thought, giving information, cautions and advice by the way, which, if regularly perused with that attention they deserve, will not be altogether powerless in forming the future literary mind of our country. The criticisms are just, and a just criticism is worth a volume of praises to a young or even old author.

THE ECLECTIC MAGAZINE.—W. H. Bidwell, Editor and Proprietor, New York. We have received the January number of this excellent periodical. It contains a portrait of Mrs. Barrett Browning, the poetess, and a picture representing Sir Walter Scott and his literary friends at Abbotsford. The articles are well chosen, as fair representatives of the kind of selections that will be made throughout the year. It is one of the best magazines published in our country, and we wish it for the New Year all that success it so well deserves.

BLACKWOOD'S EDINBURGH MAGAZINE.—Leonard Scott & Co., New York. This number contains an excellent article entitled "Phrenology in France," in which it adduces many instances of remarkable exceptions to the laws of this system, and asks the phrenologists not to explain, but to refute them. There is also an article on the "Religions of India," and many others equally interesting.

AMERICAN FARMERS' MAGAZINE.—J. A. Nash, Editor and Proprietor, No. 7 Beekman street, New York. This highly interesting and valuable periodical has entered upon its eleventh volume, and contains much matter that will interest the farmer, mechanic, and all who have the beauties of nature around them, and wish to know how to improve natural advantages by cultivation.

CHARLESTON MEDICAL JOURNAL AND REVIEW.—J. D. Burns, M. D., Editor and Publisher. This bi-monthly periodical, so often favorably noticed in our columns, has changed its editor, and seems from the January number to be as full of valuable information in the medical science as ever, if not more so.

THE NORTH CAROLINA JOURNAL OF EDUCATION.—No. 1 of Vol. 1 is received. It contains an excellent article entitled "The Bible as a School Book," in which the writer urges weighty reasons in its favor. We hope never to see the Word of God banished from its proper place as the first of all books as an educator of youth. It is a priceless gift to man.

THE YOUNG MEN'S MAGAZINE for January, published at 348 Broadway, New York, by R. C. McCormick, is an excellent number for the young men of our country, and deserves to be widely circulated and carefully read.

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